Food and Agriculture Organization of the United Nations

Italian Ministry of Agriculture and Forestry Policies

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Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea

AdriaMed Trawl Survey Information System (ATrIS): User Manual

ADRIAMED

AdriaMed Technical Documents No. 17

SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

MiPAF

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AdriaMed Trawl Survey Information System (ATrIS): User Manual

by

Roberto Gramolini, Piero Mannini, Nicoletta Milone, Vincenzo Zeuli

AdriaMed Technical Documents No.17 Termoli (Italy), May 2005
GCP/RER/010/ITA/TD-17

Preface

The Regional Project "Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea" (AdriaMed) is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Italian Ministry of Agriculture and Forestry Policies (MiPAF).

AdriaMed was conceived to contribute to the promotion of cooperative fishery management between the participating countries (Republics of Albania, Croatia, Italy, Serbia-Montenegro and Slovenia), in line with the Code of Conduct for Responsible Fisheries adopted by the UN-FAO.

Particular attention is given to encouraging and sustaining a smooth process of international collaboration between the Adriatic Sea coastal countries in fishery management, planning and implementation. Consideration is also given to strengthening technical coordination between the national fishery research institutes and administrations, the fishery organizations and the other relevant stakeholders of the Adriatic countries.

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GCP/RER/010/ITA Publications

The AdriaMed Project publications are issued as a series of Technical Documents (GCP/RER/010/ITA/TD-00) and Occasional Papers (GCP/RER/010/ITA/OP-00) related to meetings and research organized by or conducted within the framework of the Project.

Occasionally, relevant documents may be translated into national languages as AdriaMed Translations (GCP/RER/010/ITA/AT-00).

Comments on this document would be welcomed and should be sent to the Project headquarters:

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Preparation of this document

The AdriaMed Trawl Survey Information System (ATrIS) is a computerized system, based on Microsoft Access© for organizing storing and undertaking the preliminary analysis of the dataset available after the AdriaMed trawl surveys. It was conceived and designed as a simple and common tool to store and perform basic processing of the data collected by the countries participating in the AdriaMed demersal trawl survey.

The software has been designed and developed with the kind collaboration of the Laboratory of Marine Biology of Fano (Italy), the Institute of Oceanography and Fisheries of Split (Croatia), the Laboratory of Marine Biology of Bari (Italy), the Fisheries Research Institute of Ljubljana (Slovenia), the Institute of Marine Biology of Kotor (Montenegro) and the Fisheries Research Institute of Dürres (Albania).

The scope of this manual is to provide users with guidelines on the various tools available to turn raw data into useful information. The following are summaries of the six chapters of this User's Manual: Chapter 1 contains the background information, Chapter 2 illustrates the System set up, and in Chapter 3 a general overview of ATrIS is given. Chapter 4 defines the data configuration rules and Chapter 5 explains the import/export routines. Chapter 6 illustrates how to input and retrieve data while Chapter 7 gives an overview of the analysis tools provided by the System. Finally in Chapter 8 some routines to check data consistency are illustrated.

Acknowledgements

Many thanks are due to Nedo Vrgoć, Igor Isajlović, Luca Ceriola and Bojan Marčeta for their comments and information necessary to improve this application.
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ABSTRACT

Through the FAO-AdriaMed Project the AdriaMed Trawl Survey Information System (ATrIS) has been developed as a simple and common tool to store and perform basic processing of the data collected by the countries participating in the AdriaMed demersal trawl survey. This document provides useful guidelines to ATrIS users. The objectives of the ATrIS are to facilitate storage, retrieval, updating, analysis and manipulation of trawl

surveys data including spatially referenced information; to build capacity to create, use and maintain a trawl survey database in each country; to facilitate sharing of trawl surveys data within and between countries in the Adriatic Sea. The ATrIS consists of 2 parts: i) a database (Access) for storing the spatial and monitoring data for each survey, with basic querying, updating and reporting capabilities. and ii) a spatial database that includes data stored directly within GIS (i.e. ArcView). Key concepts upon which ATrIS has been developed are regional management structure, database consistency management methods, capacity building for data analysis and GIS application and enhanced reporting capacity.

Table of Contents

1. Background information

1.1 AdriaMed Demersal Trawl Surveys

In the Adriatic, scientific bottom trawl surveys to monitor and assess demersal fishery resources have been carried out since the 1948-49 (Hvar Expedition). For the most part demersal survey sampling design could cover only national and international waters. Exceptions were the 1982-84 survey, jointly executed by Croatia and Italy in the Northern and Central Adriatic, and more recently, within the EU-funded MEDITS programme the whole Adriatic has been surveyed since 1996, with the exception of Montenegrin waters. Italy has been implementing demersal trawl surveys in national and international waters up to the territorial waters of the other coastal countries since 1985. A common approach is needed at regional level when the key demersal resources are straddling stocks across the boundaries between territorial seas and international waters where open access conditions apply. The consideration that the most important commercial stocks of the Adriatic are shared by the national fishing fleets makes it necessary their monitoring and assessment to be carried out over the whole Adriatic Sea.

During the 2nd Coordination Committee Meeting held in Slovenia (Portorož, 22-23 November 2000, AdriaMed 2001, GCP/RER/010/ITA/TD-04 refers) the "AdriaMed Trawl Survey", one of the proposed research activities, was regarded as being of prime interest; its aim was an eastward extension of the Italian demersal trawl survey to include Albanian, Croatian, Slovenian, and since 2004, Serbia and Montenegro waters. The major intentions were to collect, compile and process data following a common protocol prepared and agreed upon by all researchers involved; to carry out joint data elaboration and analysis and finally to make an appraisal of the status of demersal resources using stock assessment tools.

The programme was adopted with the participation of the scientists from four countries: Albania, Croatia, Slovenia and Italy. The programme has several objectives and among the principal aims are:

1) to describe the zoogeographic distribution and pattern occurrence of target species encountered and where possible the relationship of such patterns to observed environmental features (sea depth, sediments, temperature);
2) to estimate relative abundance indices for target species in time and space and finally, where possible to perform stock assessment.

Among the main tasks was the compilation of the index of relative biomass and abundance of shared commercial stocks and its geo-spatial variation within bathymetric strata as well as comparison between the two Geographical Sub-areas (GSA): northern and central (GSA 17) and southern (GSA 18) Adriatic Sea.

At the same time research work included issues related to the biology and population dynamics of target species such as: possible effects of fishing pressure on resource biodiversity, information on target species spawning and nursery areas, biomass distribution, as well as species vulnerability to the fishing gear.

1.2 Trawl Data

Three AdriaMed Trawl Surveys were performed in Autumn-Winter 2001/2002, 2002/2003 within international and national waters of Albania, Croatia and Slovenia and in Winter 2004 also comprising the territorial waters of Serbia-Montenegro. For the execution of the programme two vessels were used: chartered F/V “Pasquale e Cristina” in the southern Adriatic (GSA 18, Albania and Montenegro) and R/V “Andrea” in the central and northern Adriatic (GSA 17, Croatia and Slovenia).

The number of surveyed stations in the AdriaMed 2001-2002 programme, due to the available budget, was increased in the year 2003 in the waters of Albania and Croatia and adjacent international waters. The increment in the number of stations was also the consequence of direct interests and financial support of national institutes. In the case of Albania, the number of stations was increased from 18 (2001-2002) to 31 in 2003, and in the case of Croatia from 22 (2001-2002) to 42 in 2003. The number of stations in Slovenian national waters remained constant at two stations. In Montenegro the sampling stations were 20. As example, sampling stations of AdriaMed trawl survey 2003 are given in Table 1 and Figure 1.
The AdriaMed surveys were complementary to the Italian “Gruppo Nazionale Demersali” (GRU.N.D.) national survey programme in the western Adriatic.
A list of 13 target species was identified taking into consideration the list of priority species whose stocks are shared in the Adriatic Sea as identified by the AdriaMed Working Group on Demersal Resources, and reported in Annex B, Table 5 of the Working Group report (AdriaMed, 2000; Group A).

The AdriaMed surveys covered the trawlable area of the eastern Adriatic Sea, continental shelf and upper slope, from 10 to 400 m bottom depth. With regard to station selection and geographical allocation, random depth-stratified sampling design was applied, the same as is used in the case of the Mediterranean International Trawl Survey (MEDITS) Programme in the Adriatic (Anonymous, 1998). Strata were defined according to the following bathymetric limits: 10-50, 50-100, 100-200 m (GSA 17) and 200-800 m (GSA 18). The sampling procedures used are similar to and coherent with those of the Mediterranean International Trawl Survey (MEDITS) Programme (Anonymous, 1998; Bertrand, 1995, Bertrand *et al.*, 1996).
Catch in weight and number of target and non-target species was recorded and catch rates obtained. For target species biological data such as sex, gonad maturity and length-size composition were recorded. Sampling and sub-sampling procedures utilised “raising factors” in assessment of total numbers individuals caught per species. Data were entered into specially created sheets included as Annex C.

The haul logbook held the following information: haul start and end positions and time, total catch weight, bottom depth at haul start and at haul end as well as length of trawl wire released into the sea. Standard haul duration was 60 minutes irrespective of the trawling depth (stratum). The Italian commercial bottom trawl net (“tartana”) used in the GRU.N.D.

programme was constantly utilised with standard auxiliary spare parts (bottom ropes, floating balls, knotless cod-end stretched mesh size was of 20 mm). Horizontal net opening, before surveys, was measured by "Scanmar"-Norway wireless transducers, in stratum of 50-100 meters. In this case the horizontal net opening was 24,2 meters and vertical opening around 1 meter.

Table 1.1 - Coordinates of sampling stations in Albanian (A), Croatian (B) and Slovenian (C) waters and adjacent international waters during the ADRIAMED 2003 trawl survey.

A – Albania

STATION CODE	COORDINATES				DEPTH (m)
	BEGINNING OF HAUL		END OF HAUL		
	φ N	λ E	φ N	λ E	
AATS0301	41°35.30'	19°20.57'	41°38.02'	19°22.27'	45
AATS0302	41°07.47'	19°22.39'	41°04.56'	19°23.03'	41
AATS0304	41°32.24'	19°15.18'	41°35.03'	19°15.24'	84
AATS0306	41°26.24'	19°15.37'	41°29.21'	19°15.27'	97
AATS0307	41°20.39'	19°08.14'	41°18.14'	19°08.37'	96
AATS0308	41°12.23'	19°21.03'	41°09.26'	19°20.56'	62
AATS0310	40°48.14'	19°11.32'	40°45.01'	19°11.48'	86
AATS0311	40°44.34'	19° 11.04'	40°42.20'	19°10.44'	89
AATS0312	40°51.38'	19°11.55'	40°48.47'	19°11.21'	89
AATS0313	40°55.18'	19°12.05'	40°52.17'	19°12.20'	90
AATS0314	41°26.57'	19°07.04'	41°24.08'	19°06.47'	118
AATS0315	41°23.20'	19°07.22'	41°20.55'	19°08.12'	111
AATS0316	40°52.53'	19°09.22'	40°50.04'	19°09.32'	104
AATS0317	40°42.27'	19°09.33'	40°39.18'	19°09.27'	119
AATS0319	40°38.30'	19°09.40'	40°35.17'	19°11.70'	140
AATS0321	40°39.11'	19°07.58'	40°41.54'	19°06.14'	168
AATS0322	40°36.17'	19°08.60'	40°39.06'	19°07.56'	174
AATS0323	40°34.48'	19°11.02'	40°31.45'	19°11.58'	148
AATS0325	41°07.00'	18°52.08'	41°08.35'	18°52.47'	292
AATS0326	41°02.32'	18°53.47'	41°05.05'	18°52.28'	284
AATS0327	40°43.58'	18°59.26'	40°46.22'	18°58.29'	328
AATS0328	40°34.53'	19°05.32'	40°37.55'	19°04.53'	309
AATS0330	40°31.23'	19°06.06'	40°34.17'	19°05.40'	310
AATS0331	40°28.12'	19°08.33'	40°30.52'	19°08.00'	295
AATS0332	40°55.11'	18°48.48'	40°57.24'	18°47.08'	534
AATS0333	40°51.50'	18°50.46'	40°54.11'	18°49.53'	534
AATS0335	40°48.01'	18°54.05'	40°50.16'	18°52.02'	502
AATS0336	40°40.02'	18°59.54'	40°42.05'	18°58.32'	545
AATS0338	40°36.21'	19°00.22'	40°39.01'	19°00.11'	526
AATS039	40°33.00'	19°01.08'	40°30.42'	19°02.09'	545
AATS040	40°29.53'	19°03.08'	40°27.39'	19°04.40'	537

B - Croatia

STATION NUMBER	COORDINATES				DEPTH (m)
	BEGINNING OF HAUL		END OF HAUL		
	φ N	λ E	φ N	λ E	
CATS0301	44°18.37'	14°58.85'	44°16.15'	14°57.57'	47.8
CATS0302	43°49.11'	15°26.70'	43°45.63'	15°28.41'	46.3
CATS0303	43°50.15'	15°10.02'	43°52.97’	15°07.09'	52.1
CATS0304	43°59.76'	14°59.07'	44°01.73'	14°56.89'	60.6
CATS0305	44°24.66'	15°11.71'	44°27.17'	15°07.91'	60.8
CATS0306	44°31.48'	15°03.38'	44°32.96'	15°00.65'	76.7
CATS0307	44°37.35'	14°56.06'	44°39.59'	14°53.27'	200.5
CATS0308	44°47.10'	14°52.01'	44°49.32'	14°50.85'	186.0
CATS0309	44°55.40'	14°52.27'	44°57.01'	14°51.48'	169.5
CATS0310	45°04.69'	14°47.09'	45°06.94'	14°44.33'	128.5
CATS0311	45°10.32'	14°26.57'	45°06.87'	14°24.33'	81.7
CATS0312	44°04.36'	14°16.34'	45°01.36'	14°16.84'	110.0
CATS0313	44°48.89'	14°13.87'	44°46.06'	14°11.69'	141.5
CATS0314	44°42.42'	14°04.46'	44°41.20'	14°00.76'	140.5
CATS0315	44°26.61'	14°27.08'	44°24.55'	14°28.72'	118.5
CATS0316	44°15.76'	14°36.01'	44°13.72'	14°38.69'	111.5
CATS0317	44°11.66'	14°40.33'	44°10.10'	14°43.59'	119.5
CATS0318	44°33.55'	14°41.64'	44°36.98'	14°38.29'	132.0
CATS0319	43°33.09'	15°31.82'	43°31.37'	15°27.04'	139.5
CATS0320	43°30.80'	15°34.00'	43°31.65'	15°38.96'	152.5
CATS0321	43°29.92'	15°41.90'	43°27.58'	15°44.58'	160.0
CATS0322	43°26.15'	15°55.25'	43°25.54'	15°58.79'	156.0
CATS0323	43°16.26'	16°19.84'	43°16.06'	16°18.77'	76.5
CATS0324	42°57.55'	16°24.86'	42°56.77'	16°22.01'	83.8
CATS0325	42°49.72'	16°13.13'	42°50.63'	16°10.49'	53.8
CATS0326	42°52.11'	16°00.90'	42°53.55'	15°58.68'	32.0
CATS0327	43°07.07'	15°52.83'	43°08.67'	15°54.25'	24.1
CATS0328	43°09.70'	16°00.26'	43°10.27'	16°02.97'	33.9
CATS0329	42°47.20'	16°35.35'	42°45.72'	16°36.67'	72.3
CATS0330	42°40.43'	17°18.15'	42°39.72'	17°20.42'	47.8
CATS0331	42°38.81'	17°27.56'	42°38.79'	17°30.17'	46.3
CATS0332	42°37.21'	17°35.62'	42°36.54'	17°38.49'	52.1
CATS0333	42°35.08'	17°45.95'	42°34.66'	17°48.46'	60.6
CATS0334	42°33.72'	17°53.71'	42°33.54'	17°56.37'	60.8
CATS0335	42°47.65'	17°35.27'	42°47.91'	17°32.68'	76.7
CATS0336	42°49.40'	17°28.53'	42°50.02'	17°25.82'	200.5
CATS0337	43°04.01'	17°06.56'	43°04.70'	17°08.45'	186.0
CATS0338	43°01.29'	17°20.76'	43°00.26'	17°22.76'	169.5

CATS0339	42°54.79'	17°34.83'	42°56.04'	17°31.04'	128.5
CATS0340	43°03.23'	17°20.12'	43°04.62'	17°18.61'	81.7
CATS0341	43°23.01'	16°46.71'	43°23.18'	16°44.23'	110.0

C – Slovenia

STATION NUMBER	COORDINATES				DEPTH (m)
	BEGINNING OF HAUL		END OF HAUL		
	φ N	λ E	φ N	λ E	
SATS0301	45°36.29'	13°39.11’	45°35.94'	13°36.52'	23.2
SATS0302	45°35.10'	13°34.14’	45°34.11'	13°31.49'	23.6

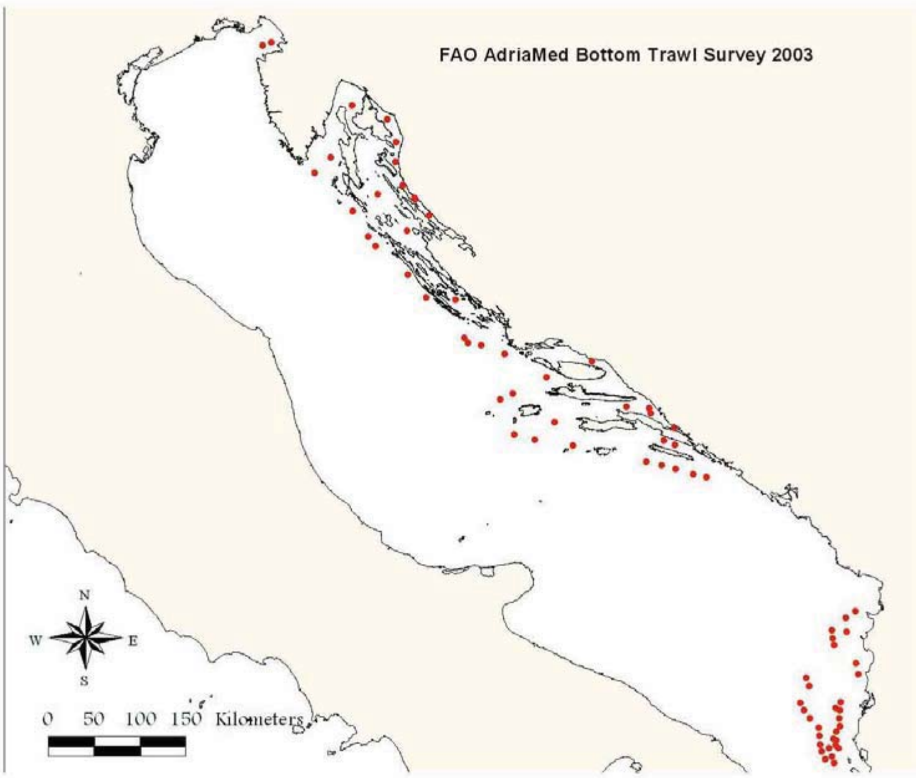


Figure 1.1. Geographical allocations of the stations in the national and adjacent international waters of Albania, Croatia and Slovenia sampled during the AdriaMed 2003 bottom trawl survey.

1.3 The AdriaMed Trawl Survey Databank (Microsoft Excel© version)

Since the AdriaMed trawl surveys were carried out, the need to have the large amount of collected data easily available for use was identified. The creation of a regional logical databank holding all the data collected by country and for the whole region was undertaken. The idea was to design a simple system to store the available data and which would facilitate basic analysis. The proposal was illustrated at the Fourth Meeting of the AdriaMed Coordination Committee held in Split, Croatia, December 2002 (AdriaMed, 2003). On that occasion it was agreed that it would be necessary and appropriate to finalize the logical

databank proposed by the Project so as to hold the whole data set obtained from the execution of the bottom trawl survey in 2001/02.

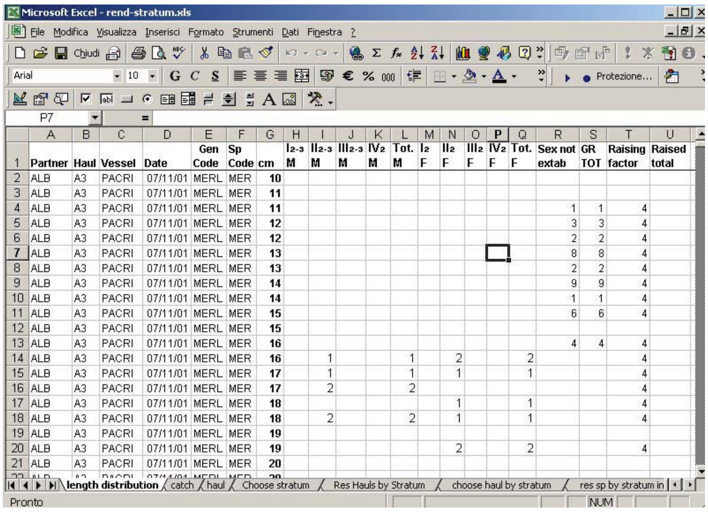
One of the main objectives was to create a basic and useful tool common for the AdriaMed countries participating in the survey and that would allow the facilitation and standardisation of the data entry work.

The creation of the data bank allowed for:
- Effective survey data sharing among the participating countries;
- Implementation of common data collection protocol;
- Standardization of the data entry procedures;
- Standardization of primary data compilation and reporting.

Taking into consideration that basic analysis of the rough data is the starting point for any stock assessment and resource appraisal work, a system was designed that would be user-friendly even with non specialized users. The Project chose Microsoft Excel© software because of the following characteristics:

- ✓ Widespread accessibility and familiarity of use among scientific staff of all Adriatic countries;
- ✓ Straightforward application and maintenance;
- ✓ Possibility for easy data exchange with other common software systems;
- ✓ Simple export/import of data to and from other data file formats as Microsoft Excel© is usually distributed with a package of other Microsoft software.

The Excel© system offered few basic utilities to run simple queries; with a few steps it allows the user to visualize tables and charts of the data filtered (Milone *et al.*, 2004). The Excel© application was distributed to the National Focal Points and to the research institutes participating in the AdriaMed demersal survey programme and it was used to store and run the basic analysis of the AdriaMed Trawl Survey 2003/2004 data.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Partner	Haul	Vessel	Date	Gen Code	Sp Code	cm	I_{2-3} M	II_{2-3} M	III_{2-3} M	IV_2 M	Tot. M	I_2 F	II_2 F	III_2 F	IV_2 F	Tot. F	Sex not extab	GR TOT	Raising factor	Raised total
2	ALB	A3	PACRI	07/11/01	MERL	MER	10														
3	ALB	A3	PACRI	07/11/01	MERL	MER	11														
4	ALB	A3	PACRI	07/11/01	MERL	MER	11											1	1	4	
5	ALB	A3	PACRI	07/11/01	MERL	MER	12											3	3	4	
6	ALB	A3	PACRI	07/11/01	MERL	MER	12											2	2	4	
7	ALB	A3	PACRI	07/11/01	MERL	MER	13											8	8	4	
8	ALB	A3	PACRI	07/11/01	MERL	MER	13											2	2	4	
9	ALB	A3	PACRI	07/11/01	MERL	MER	14											9	9	4	
10	ALB	A3	PACRI	07/11/01	MERL	MER	14											1	1	4	
11	ALB	A3	PACRI	07/11/01	MERL	MER	15											6	6	4	
12	ALB	A3	PACRI	07/11/01	MERL	MER	15														
13	ALB	A3	PACRI	07/11/01	MERL	MER	16											4	4	4	
14	ALB	A3	PACRI	07/11/01	MERL	MER	16		1			1		2			2			4	
15	ALB	A3	PACRI	07/11/01	MERL	MER	17		1			1		1			1			4	
16	ALB	A3	PACRI	07/11/01	MERL	MER	17		2			2								4	
17	ALB	A3	PACRI	07/11/01	MERL	MER	18							1			1			4	
18	ALB	A3	PACRI	07/11/01	MERL	MER	18		2			2		1			1			4	
19	ALB	A3	PACRI	07/11/01	MERL	MER	19														
20	ALB	A3	PACRI	07/11/01	MERL	MER	19							2			2			4	
21	ALB	A3	PACRI	07/11/01	MERL	MER	20														

Figure 1.2. Example of a working spreadsheet of the AdriaMed application, based on Excel©.

1.4 The AdriaMed Trawl Survey Information System – ATrIS (Microsoft Access© version)

Throughout the development phase of the AdriaMed Trawl Survey Databank, many valuable suggestions and comments were received from experts collaborating with AdriaMed and were duly taken into account. The logical next step was the migration of the Excel© application on a Microsoft Access© platform, better suited to hold the large data set expected to be available in the near future (with the AdriaMed Trawl Survey 2004). The structure for the AdriaMed Trawl Survey Information System (ATrIS) has been designed to be simple, yet flexible. The objective was to create a simple database structure that could accommodate a wide range of data types. The new application is also easily linkable with GIS application.
The software environment (Access) that was chosen was the one which makes it very easy to move data from one format to another (e.g. between Access and ArcView©, or between Access and Excel). The ODBC standards were used, a programming interface which enables applications to access data within database management systems that use SQL (structured query language) as a data access standard. This also allows it to seamlessly interact with tables and queries from Access in ArcView.

The objectives of the ATrIS are as follows:
-to facilitate storage, retrieval, updating, analysis and manipulation of trawl surveys data including spatially referenced information;
-to build capacity to create, use and maintain a trawl survey database in each country; and
-to facilitate sharing of trawl surveys data within and between countries in the Adriatic Sea.

The ATrIS consists of 2 parts (Figure 1.3):
--A database (Access) for storing the spatial and monitoring data for each survey, with basic querying, updating and reporting capabilities. and
--A spatial database that includes data stored directly within GIS (i.e. ArcView).

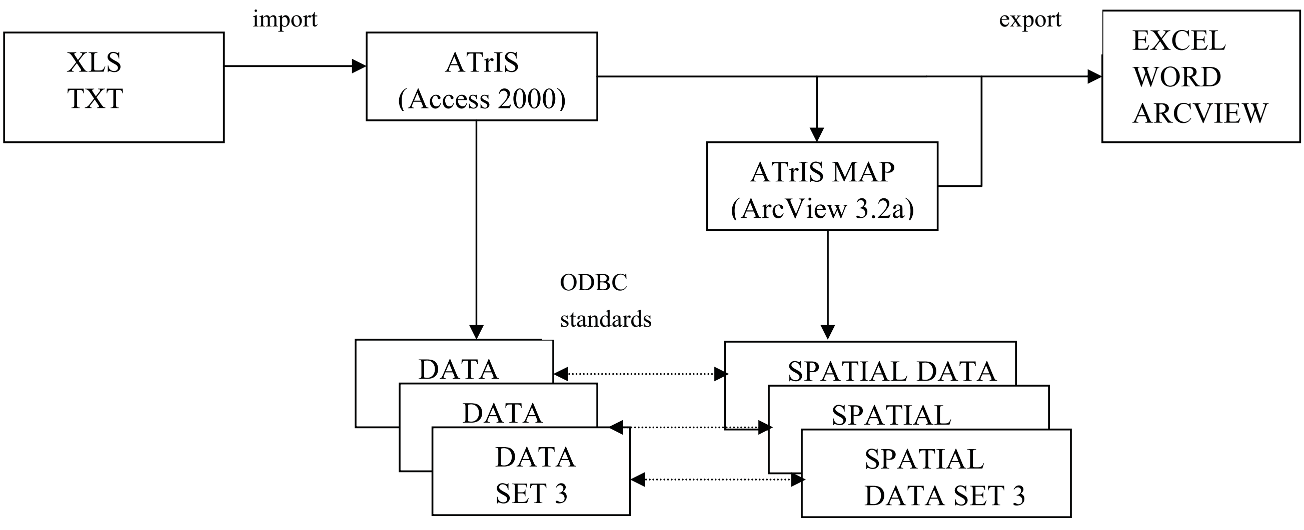


Figure 1.3. Basic scheme of ATrIS structure.

1.5 Some key concepts of ATrIS

Hereunder some key concepts upon which ATrIS has been developed are summarized.

-- Regional management structure. It is vital that data access rules and procedures, and preferred data formats be developed or suggested by the countries rather than imposed by others. ATrIS was developed on request of the AdriaMed Adriatic experts and taking into a consideration the problems arising in data sharing, this led to the creation of a very flexible application. Moreover the active involvement by scientists in the improving and testing phase would gave a regional perspective to ATrIS.

-- Database consistency management methods

The general objectives of designing data entry functions are to establish consistency of data entry transactions, ensure compatibility of data entry with data display and provide flexibility of user control of data entry. Data validation is developed based on the data management/data validation plan and data specifications. They include several types of listings as well as queries. They cover, though are not limited to, the verification of out-of-range values and inconsistencies between data and protocol compliance checks. In ATrIS checking data consistency is done in three steps:

i) *Controlled data entry:* a validation programme that verified field consistencies to identify records with errors (range checks, internal and external table look-up, re-key verification…)

ii) *Tracking of individual changes:* automatic attribution of individual IDs, verification of household and individual IDs, using message boxes for warnings.

iii) *Illegal data checks*: Illegal data are variable values or combinations of values that are literally impossible for the actual phenomenon of interest; ATrIS uses several filters to detect illegal data (e.g. keypunch errors; illegal data filter programs; detection of outliers in samples; and detection of outliers and leverage points in simple linear regression)

The development and application of these methods of consistency management has great potential to improve the quantity and quality of data provided, also for decision support for management.

-- Capacity building for data analysis and GIS application

ATrIS provides basic querying, updating and reporting capabilities with the possibility to support a first basic data analysis based on GIS.
The technical capacity to analyse data is built up providing two main analysis types:

i) *Data analysis:* a system of queries that allows the user to calculate biomass and abundance indexes, to chart length frequency distribution and maturity and sex distribution;

ii) *GIS map creation:* some basic GIS tools which provide the visualization of survey data. These tools represent an approach to developing meaningful, quantitatively

reliable and presentable thematic images. Moreover the final release of the trawl survey data bank application includes a digital chart (scale 1:250000) of the Adriatic Sea obtained through the cooperation of national hydrographical institutes.

--Enhanced reporting capacity

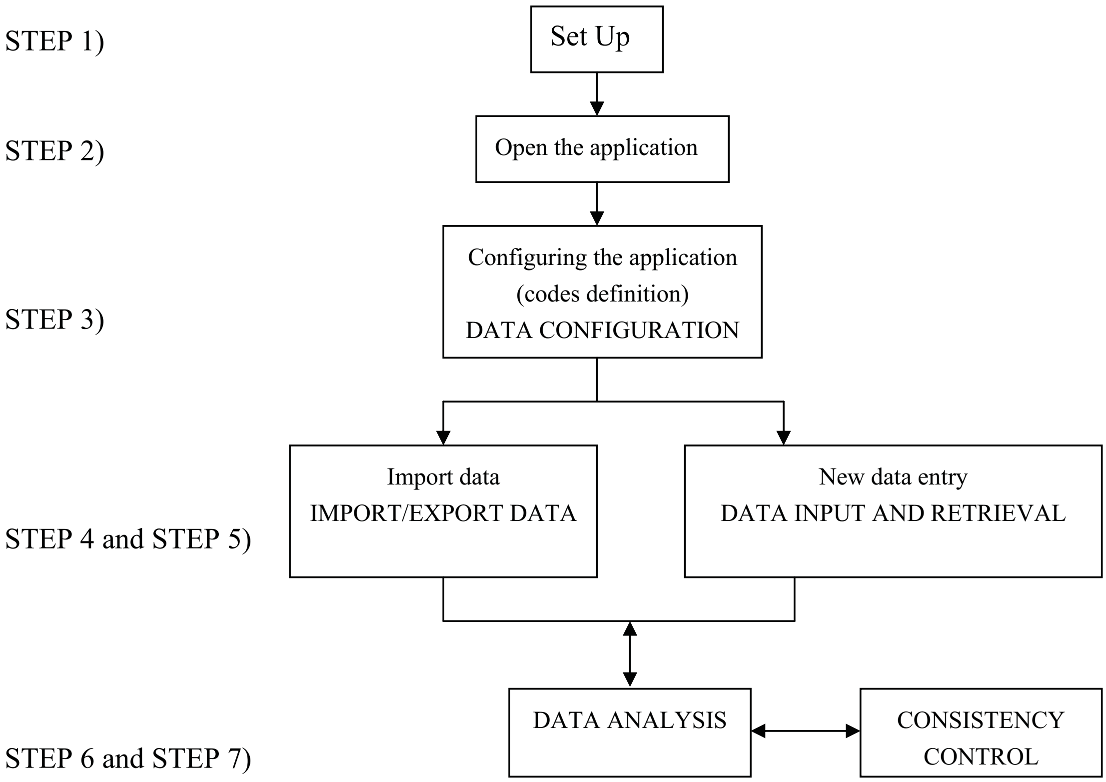
Database management systems are developed primarily for generating reports. A key function of ATrIS is the ability to generate tables and graphic reports of the selected data. Reports are available in a printer format and contain all fields and records that occur in the table or query that was used.

The possibility to create a report gives the opportunity to:
--give a general idea of the activities carried out during the survey
--facilitate the data storing
--facilitate data control
--improve the daily activities of data research and recording
--facilitate the organization of data.

This automation can also be remarkable timesaving tool for users who are required to produce regular data reports and to review or plan a new survey.

1.6 Introduction to ATrIS

In the following chapters each sections will be dealt with, starting with the Setup. In the Figure 3 a flowchart to follow during the start up of the application is given. The chapters will be treated in the same order.



Step 1 --SET UP
As for every application ATrIS must be installed on a PC following a Set Up procedure. The procedure is illustrated step by step in chapter 2 and will guide users to correctly install the application.

Step 2
Once the application is installed ATrIS can be run on a PC: simply open on the menu bar the file ATrIS and the database will ask for a username and password. In chapter 2 all the actions that should be carried out to open the application are also indicated

Step 3-- DATA CONFIGURATION
Once the application has been opened a series of configurations must be performed to use ATrIS: the configuration should be run each time a new set of data is inserted in the database. Please note that without the correct data configuration the database is not able to

detect/analyze the data. The data configuration is given in chapter 4: all the necessary actions are illustrated guiding the users to setup the data codification system.

Step 4 and 5 --IMPORT/EXPORT DATA-- DATA INPUT AND RETRIEVAL
The next logical step, after the data configuration, is to insert data in the database: the import procedure or the simple data entry are both options contemplated in ATrIS. Chapter 5 and chapter 6 illustrate the import/export and the data retrieval.

Step 6 –DATA ANALYSIS
Once the data are in the database, data analysis can be performed. ATrIS provides some simple tools for the basic processing of data and some features for some GIS applications. Chapter 7 illustrates the basic data analysis tools provided by ATrIS.

Step 7--CONSISTENCY CONTROL
ATrIS has a powerful system of error control and checks of data consistency which help users to perform data control. Chapter 8 displays the checking data consistency tools.

2 SET UP and Installation of the Suite "AdriaMed Trawl Information System" (ATrIS)

The package comes with the User Manual and a CD-ROM. The following minimum configuration is required:
--Microsoft Access (version used to develop the Suite ATrIS), (the system has bee tested for Microsoft Windows 1998, 2000, XP, Xme but has not yet be tested on MSWindow 95)
--Esri Software ARCVIEW ver.3.2x or higher**.
--1024x768 high resolution monitor**

The CDROM contains two folders with the two versions of the ATrIS application developed on Microsoft Access 1997 (97) and Microsoft Access 2000 (2000).
For MSAccess 1997 use the ATrIS 97 version. For MSAccess 2000 or XP please use ATrIS 2000.
The following procedures should be performed:

1) Open the CD-ROM
2) Open the folder you want to install (e.g. 97)
3) Install ATrIS Server (e.g. ATrIS_SERVER.exe)
4) Install ATrIS Client (e.g. ATrIS_CLIENT97.exe)
5) Launch ATrIS from the START Menu Bar
6) Set up the ATrIS Reference Files
7) Open ATrIS application
8) Insert User name and Password

To install the system simply follows the indication in the following paragraphs. Please note that a different installation should be performed if a STAND ALONE or a NETWORK installation can be set up.

2.1 Stand Alone Installation

If your PC is not part of a LAN, Local Area Network, you should install both the client and server side of the Suite ATrIS on your PC or, on each PC. See para 2.3 for Server Installation and 2.4 for Client Installation and 2.8 for updating of the data archive.



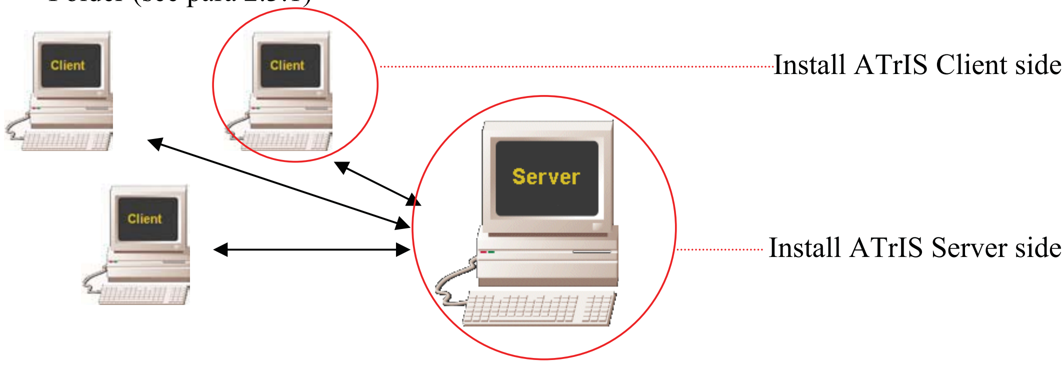
or



2.2 Network Installation

If your PC is part of a LAN you should perform a Network installation: in this case the installation of the server side of ATrIS is carried out just on one PC.
The procedure for a network installation is the following:

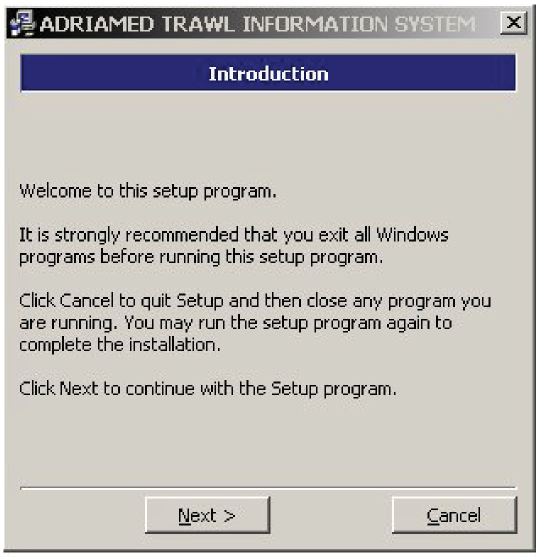
a) Select a PC which will be considered the Server PC. On this PC install ATrIS_Server.exe (see para 2.3 for Server installation).
b) On the other PC (the client PC) install only the Client side of ATRIS (ATrIS_Client.exe, see para 2.4 for Client Installation)
c) On each PC Client in the SET UP (see para XX) link the Client to the Server (indicate the right path of the ATrIS_S.mde in the DATABANK field).
d) On the PC Server (not on the PC client) activate the Sharing Property of the ATrIS Folder (see para 2.3.1)



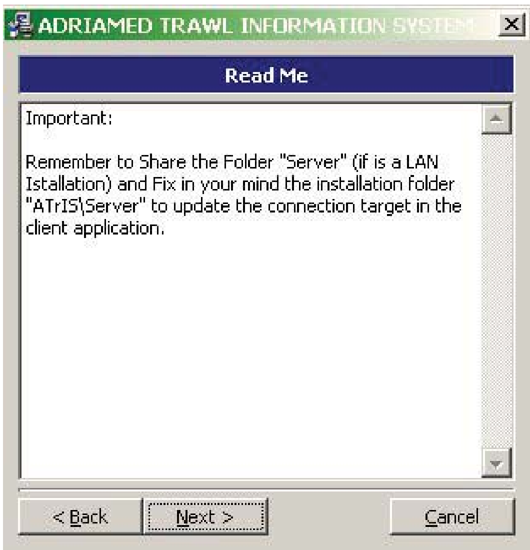
2.2.1 PC Server Installation

Double click on the file **ATrIS_Server.exe:** it will automatically install the file **ATrIS_S.mde,** the only component of the server side. This file contains the data consulted by the PC client. The procedures for the installation are as follows:

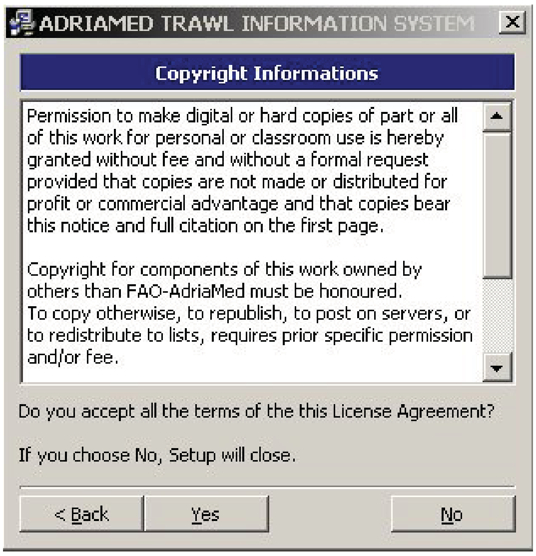
1) An introduction mask will introduce to the installation procedure. Click on NEXT



2) The Set UP procedures will automatically create a directory on C (C:\\ATRIS\Server). Please take note of the installation path: you should link the server PC to the Client PC/PCs (see para 2.7). Click on NEXT.



3) The following mask gives the copyright information. Please read it carefully before proceeding in the installation and click YES if you agreed to the above terms of agreement.



4) When the following mask is opened the default path of the destination folder will be displayed. Automatically the system will create the folder SERVER under the ATrIS Application (C:\\ATrIS\Server). To modify the path, click on Browse and select the new directory in which you would like to install the Server side.

Please note that the installation path displayed in this mask is the same path that should be inserted during the SETUP to link the PC Server and the PC Client.

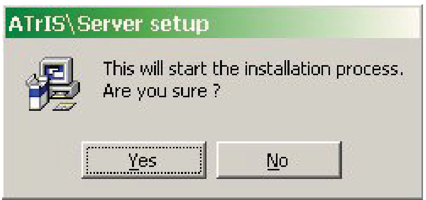
WARNING. Do not use a name directory with space between words (e.g. do not put the ATrIS application under Program Files). If you like to create a new directory please use the underscore symbol (e.g. to create the “my software” directory write it as my_software). Click on NEXT



5) The SETUP application will then summarize the SETUP settings.
Click on Install to begin the installation.



6) Click YES to start the installation.

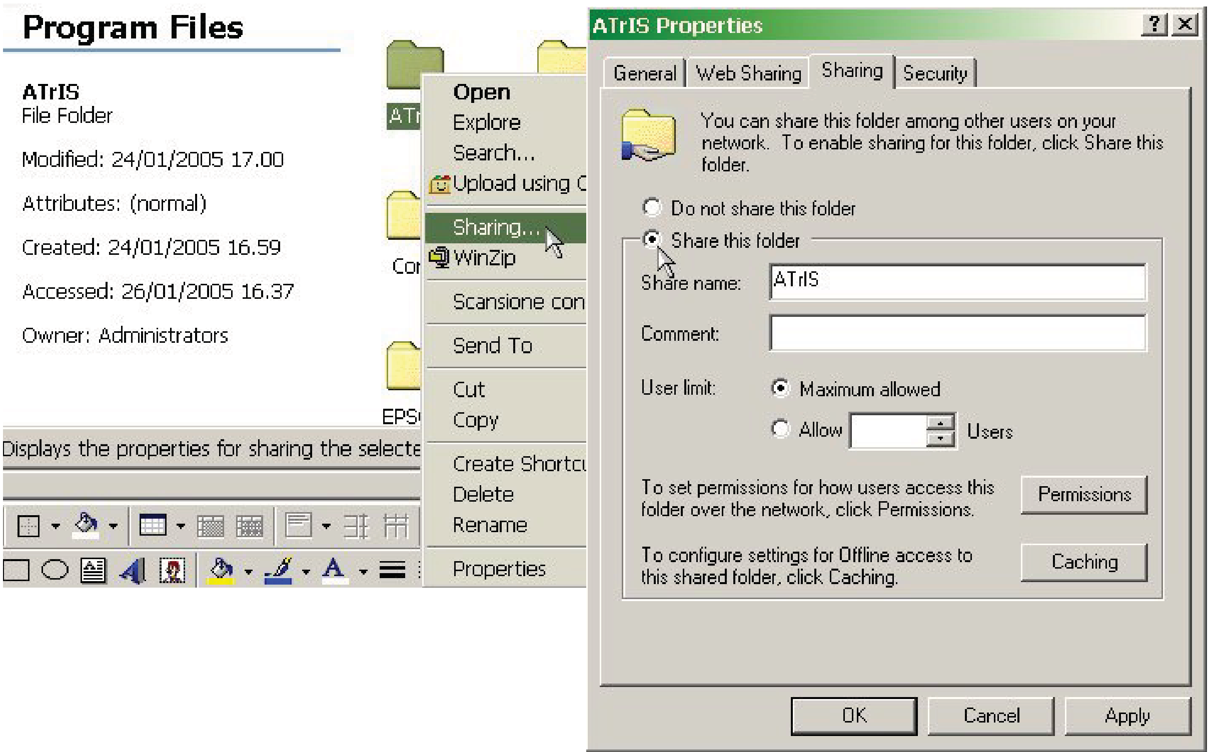


7) Once the system files are all copied a mask will be shown.
Click on FINISH.



2.2.1.1 PC Server Sharing Properties

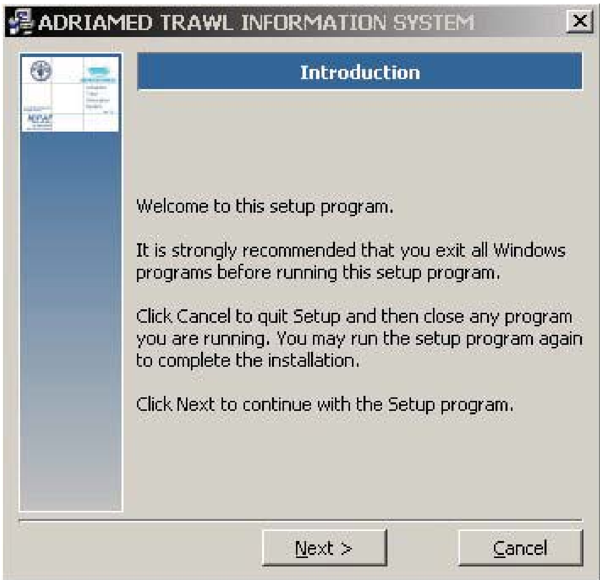
To define the sharing properties on the PC Server the procedures is as follows:
1) Click on the ATrIS Folder with the right button of the mouse. A window will open.
2) Click on SHARING
3) Select the Sharing folder and check the filed SHARE THIS FOLDER
4) Click on Apply and then on OK



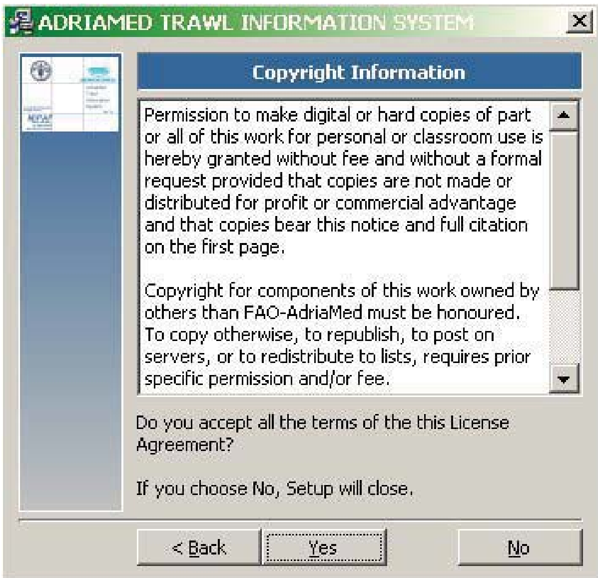
2.2.2 PC Client installation

On the CD-ROM double click on ATrIS_Client.exe file to start the installation. The procedure for the installation of ATrIS on PC client is the following:

1) An introduction mask will introduce to the installation procedure. Click on NEXT

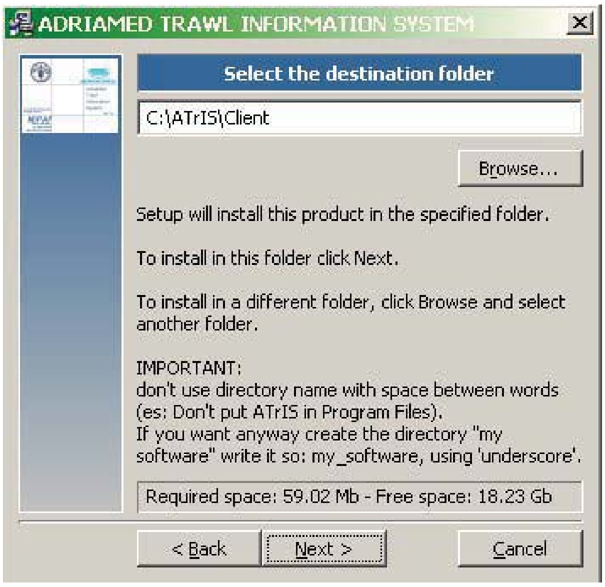


2) The following mask gives the copyright information. Please read it carefully before proceeding in the installation and click YES if you agreed to the above terms of agreement.



3) When the following mask will be opened the default path of the destination folder will be displayed. Automatically the system will create the folder CLIENT under the ATrIS Application (C:\\ATrIS\CLIENT).

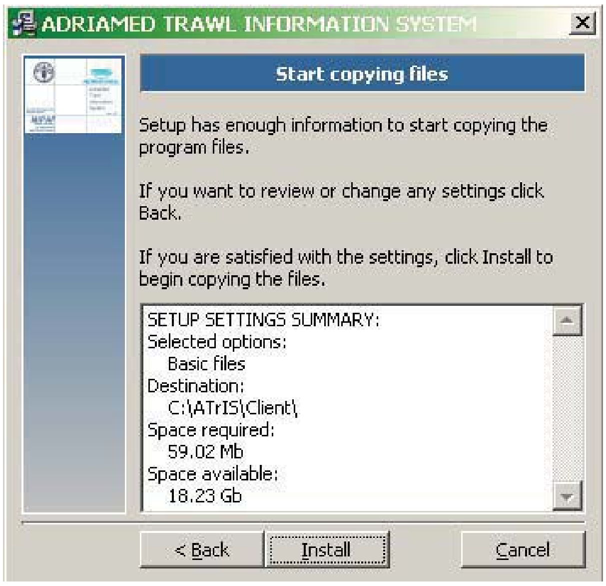
To modify the path, click on Browse and select the new directory in which you would like to install the Client side.
Please note that the installation path displayed in this mask is the same as that which should be inserted during the SETUP to link the PC Server and the PC Client.



4) The Set Up will add an icon to the Program folder on the desktop BAR of your PC. The default name is ATrIS\Client. Click on NEXT. Please note that you may type a different folder name.



5) The SETUP application will then summarize the SETUP settings. Please check if the Space required is compatible (lower) with the Space available on the PC.
Click on Install to begin the installation.



6) Click YES to start the installation.



7) Once the system files are all copied a mask will be shown.
Click on FINISH.

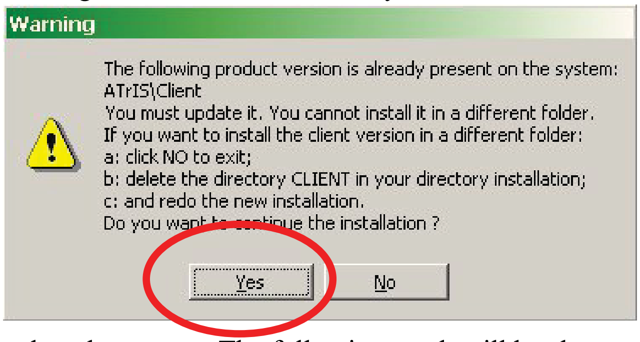


Once the installation is completed the ATrIS icon will be displayed on the Menu Bar of your desktop.



2.2.2.1 Update the PC CLIENT

Please note that if you are updating the PC Client (and the ATrIS directory is already on your PC) the following mask will be displayed. Click on Yes to continue the update procedures following the step 1-7 above illustrated. Please note also that since this operation is an update procedure you cannot change the installation directory.

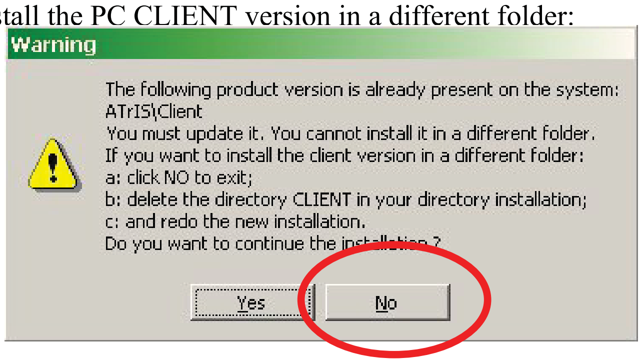


1) Click on YES to update the system. The following mask will be shown:



Click on SKIP to continue the update procedure.

If you want to install the PC CLIENT version in a different folder:



1) Click NO to exit;
2) Open the CLIENT folder created during the installation C:\ATrIS\Client
3) Delete the folder C:\ATrIS\Client

4) Start a new ATrIS installation

Please note that the update is possible only on the PC Client. **<u>An update on the PC Server will delete all the data added:</u>** for any problems with the PC Server configuration please contact the AdriaMed Project.

2.3 Activate the application

When two or more versions of MS ACCESS are installed on a PC users can configure the ATrIS application in order to always launch it with the same MS Access version.
The procedure is the following:

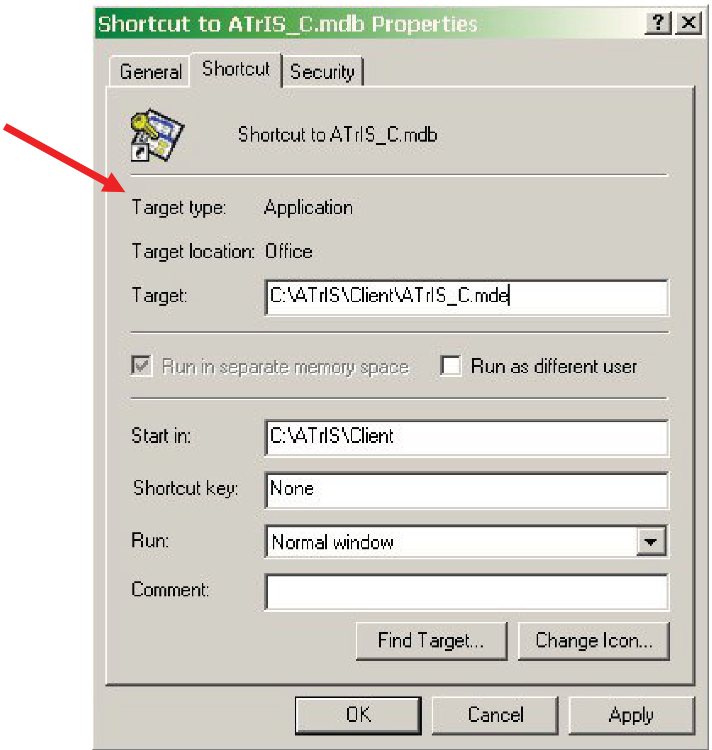
1) Click on the START BAR and select ATrIS



2) Select ATrIS CLIENT

3) Click with the right button of the mouse ATrIS CLIENT

4) Select Properties. In the Section SHORTCUT the field TARGET will show the PC CLIENT path (by default **C:\\ATrIS\Client\ATrIS_C.mde)**



5) Add to the PC CLIENT path C:\\ATrIS\Client\ATrIS_C.mde the path of the MS ACCESS version to be used. e.g. “C:\Program Files\Microsoft Office\Office\MSACCESS.EXE” C:\ATrIS\Client \ATrIS_C.mde

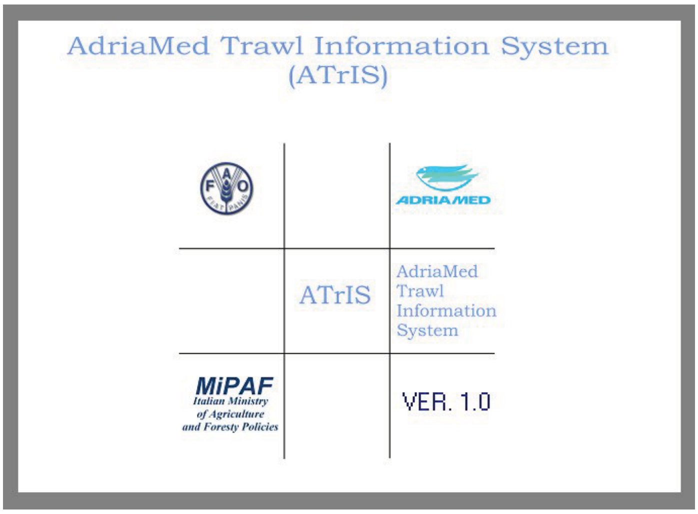
Please note that quotes “” should be used to write the path in the correct way

6) Click on Apply than click on OK

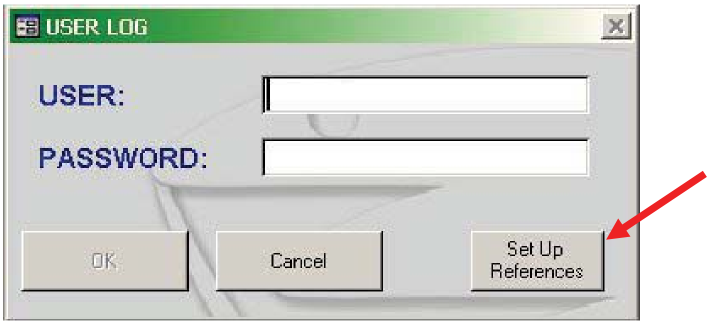
2.4 Set Up PC Client application

The first time you launch ATrIS the Set up of the Reference Files should be carried out.

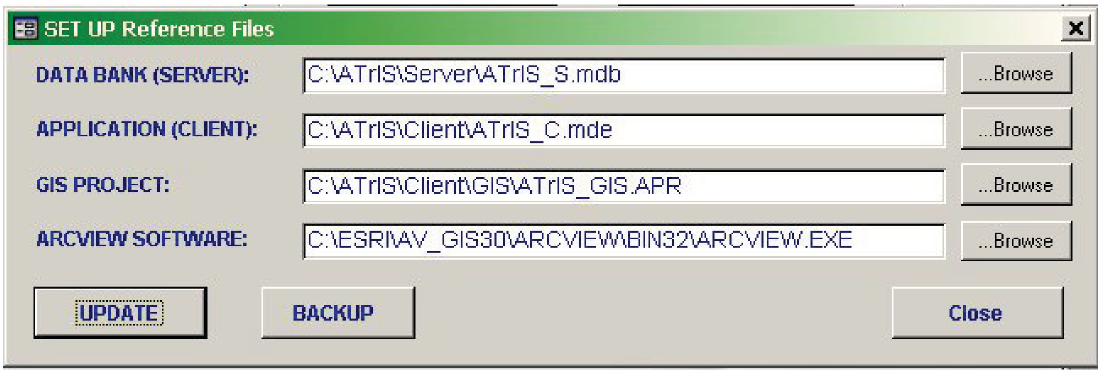
1) Launch ATrIS
2) The following mask will be shown for few seconds



3) After few seconds a new mask will be displayed



4) Click on the magic wand button. A **Setup Reference Files** mask will be shown.



Please note that the system will automatically compile all the fields except for the last one (see point 4)

1) DATA BANK (SERVER): the system has already compiled this field correctly if a default configuration has been chosen. If you changed the Set up installation path please insert the new correct path by clicking on the BROWSE button.
2) APPLICATION (CLIENT): the system has already compiled this field correctly if a default configuration has been chosen. If you changed the Set up installation path please insert the new correct path by clicking on the BROWSE button.
3) GIS PROJECT: This part represents the graphic tool of ATrIS. During the installation a directory GIS will be created under C:\ATrIS\. If you changed the Set UP installation path please insert the new correct path by clicking on the BROWSE button.
4) ARCVIEW SOFTWARE: ATrIS contains some graphic features which can only be opened with ArcView software. The system will leave this field blank: if your PC has a registered version of ArcView please indicate the path of the executable file (ArcView.exe).

Please note that to configure the system points 1 and 2 are needed and must be compiled. Points 3 and 4 are not needed for the correct functioning of the system. If you leave blank the GIS PROJECT and ARCVIEW SOFTWARE fields the system will work but the graphic tools will be not available.

5) Click on UPDATE to activate the new references
6) The following mask will be shown.



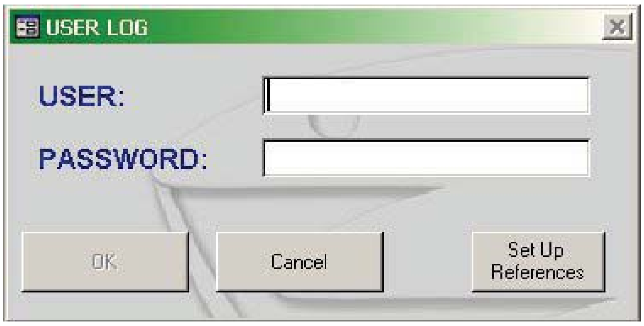
Click on OK. Please note that if this mask will be not displayed an error has occurred. Check the path and try again.



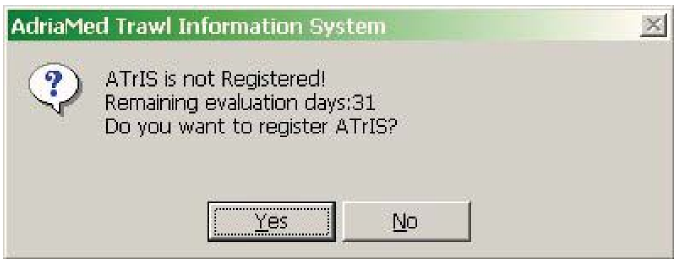
7) Click on BACKUP to make a backup of the Server ATrIS containing all the data stored.



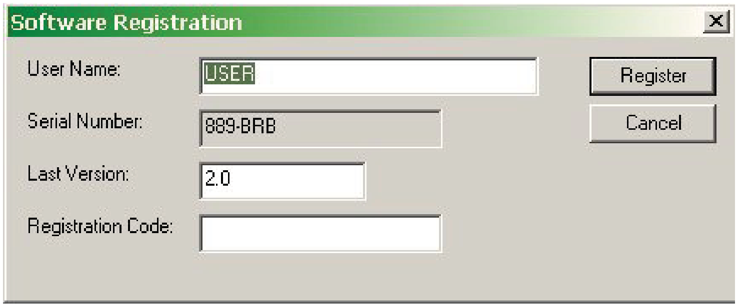
8) Click on CLOSE to go back to the USER LOG mask, insert the User name and password.



A mask will be shown.



You should register the application. Please note that you have just one month to use the application.
If you click NO you will skip the registration
If you click YES the following mask will appear:



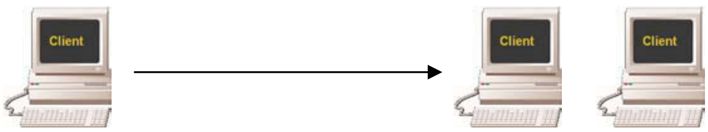
Click on Cancel to work with ATrIS.
To register the application kindly take note of the serial number, leave all the rest as in the picture, and communicate it to AdriaMed (by email or by telephone). You will receive a Registration Code: Insert the registration code in the relative field and click on REGISTER.

2.5 Update the data archive (Stand alone installation)

If the installation carried out was a stand alone installation to update the archive two cases are to be considered.

Case 1) *Just one PC is qualified to update the archive*

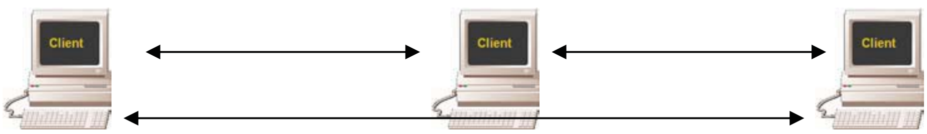
Every time you update the archive (e.g. each time you open ATrIS and add/delete/modify data) you must update the ATrIS archive on the other PC on which you decided to install ATrIS. Use the EXPORT/procedure to extract the new inserted data (.txt or .xls). Afterwards import the data using the IMPORT/procedure on each other PC to update the other archive (see chapter 5 for import/export procedures).



EXPORT IMPORT

Case 2) *two or more PC are qualified to update the archive*

Each PC must use the EXPORT/procedure to produce the file (.txt or .xls) containing the updated archive and use the IMPORT/procedure to insert the updated archive produced by the others PCs (see chapter 5 for import/export procedures).

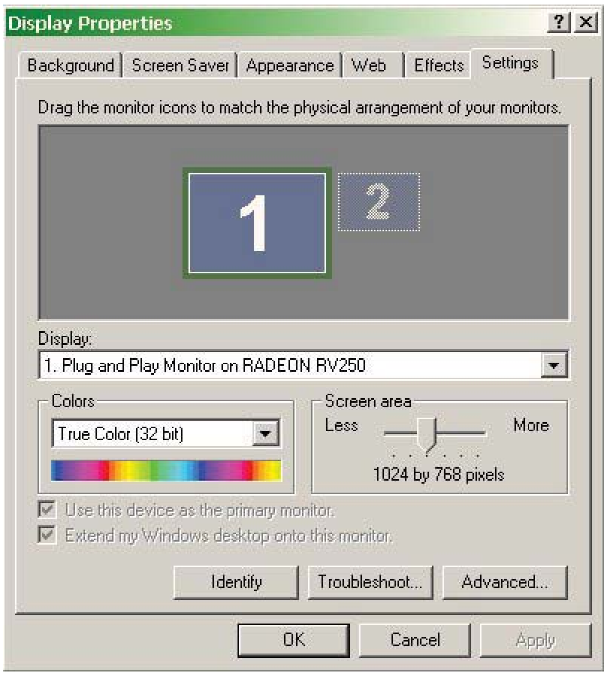


IMPORT/EXPORT IMPORT/EXPORT IMPORT/EXPORT

2.6 How to change the screen resolution

This software is developed for a screen resolution 1024 x 768. If your PC has a lower resolution please change it to display ATrIS correctly.
To change or check the screen resolution the procedure is the following:

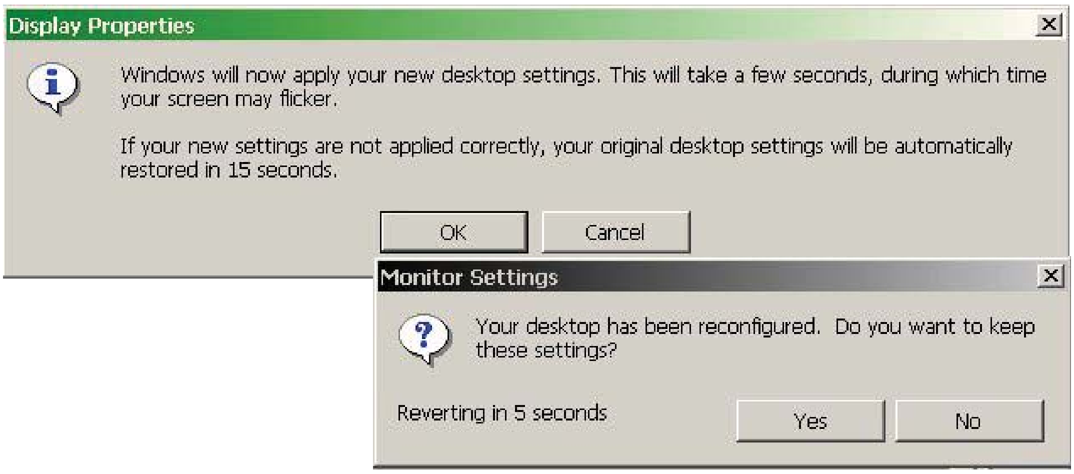
1) Right click on desktop and choose "Properties" from the MENU.
2) From the mask "Display Properties" choose the label Settings. Modify the section "Screen area" to the resolution to 1024 x 768 only if the settings of your PC are lower.



3) Now click on the button OK to confirm the choice:



4) Click on OK to confirm again the choice.



3. The Application

3.1 Data encoding

The data are stored into three main tables: HAUL, CATCH and BIOLOGICAL DATA. Users are not allowed to see or manage these tables but in the procedure of import data or data entry the knowledge of the fields required by the system is essential to understand the application performance properly.
Each table contains information on one survey. The table HAUL includes technical data on hauls carried out during that survey (such as geographical coordinates, duration and parameters required to estimate the area swept by the gear). In Table 3.1 details on specifications of the field used in the table HAUL are reported.
Information on the catches recorded (in number and in weight) during the cruises is reported for each species in the table CATCH (Table 3.2). Finally records with frequencies grouped in length classes, for each species, or individual length and sex data are reported in the spreadsheet BIOLOGICAL DATA (Table 3.3).

3.1.1 Haul data

Table 3.1. Fields in the structure record of the HAUL Data Table.

Field	Note
Country Code	The name of the country participating.
Haul Code	This number is a key field for accessing record in the database. Therefore each fishing station must have its unique station number. The haul code has a digit code indicating the number assigned to trawl station (e.g. 1,2,3…..n)
Vessel Code	The name of the vessel.
Gear Code	The name of the gear used during the survey
Validity	This field specifies if the haul is valid or not
Date	This field contains the date in European standard format in day/month/year sequence
Time (00:00)B	Time at the beginning of the trawl haul
Latitude B	The Latitude at the beginning of the trawl haul, as degrees, minutes, and seconds in time format (indicate N or S, i.e. N41 13.41)
Longitude B	The Longitude at the beginning of the trawl haul, as degrees, minutes, and seconds in time format (indicate E or W, i.e. E19 22.59)
Depth (m)B	The bottom depth in metres at the beginning of the haul operation
Time (00:00)E	Time at the end of the trawl haul
Latitude E	The Latitude at the end of the trawl haul, as degrees, minutes, and seconds in time format (indicate N or S, i.e. N41 13.41)
Longitude E	The Longitude at the beginning of the trawl haul, as degrees, minutes, and seconds in time format (indicate E or W, i.e. E19 22.59)
Depth (m)E	The bottom depth in metres at the end of the haul operation
Stratum Code	The code assigned to each stratum (i.e. for MEDITS survey the code is a five digit

	code assigned to each stratum "21101"). This field should be a text field.
Haul length	This field indicates the length of haul in metres
Horizontal spread	The horizontal spread of the net mouth (meters)
Vertical spread	The vertical spread of the net mouth (meters)
Sweep length	The length of the trawl sweep in centimetres
Warp length	The length of the trawl warp in centimetres
Route	The direction of the trawl operation in degrees
Speed (knots)	The mean speed of the vessel during trawling in knots
Bottom shape	This is a three letter code indicating the bottom characteristics during the trawl operation
Weather conditions	Some notes on the weather conditions during the trawl operation
Sea conditions	Some notes on the sea conditions during the trawl operation
Wind direction	The wind direction during trawling
Wind speed	The wind speed during trawling
Note	Any comments

3.1.2 Catch data

Table 3.2. Fields in the structure record of the CATCH Data Table.

Field	Note
Country Code	The name of the country participating.
Haul Code	This number is a key field for accessing record in the database. Therefore each fishing station must have its unique station number. The haul code has a digit code indicating the number assigned to trawl station (e.g. 1,2,3…..n)
Species code	This is a 7 letter code to identify the species name following the MEDITS rules (i.e. *Merluccius merluccius* MERLMER)
Total weight (Kg)	The weight of the species in kg on the total catch
Total number	The number of the specimens caught
Raising factor	The raising factor used

3.1.3 Biological data

Table 3.3. Fields in the structure record of the BIOLOGICAL Data Table

Field	Note
Country Code	The name of the country participating.
Haul Code	This number is a key field for accessing record in the database. Therefore each fishing station must have its unique station number. The haul code has a digit code indicating the number assigned to trawl station (e.g. 1,2,3…..n)
Species code	This is a 7 letter code to identify the species name following the MEDITS rules (i.e. *Merluccius merluccius* MERLMER)
Total weight (Kg)	The weight of the specimen/s in kg
Total number	The number of the specimen/s caught
Length (mm)	The individual/grouped measurement of length in millimetres

Sex	The sex of specimens caught
Maturity	The class of the maturity scale used
Maturity scale	The maturity scale used

3.2 Control panel

Once the set up is completed the application will be opened in a "CONTROL PANEL" (Figure 3.1). It contains 5 labels which indicate 5 different panels of the application:

- **Data input and retrieval**
- **Data analysis**
- **Import/export data**
- **Data Configuration**
- **Consistency Control**

The application will display by default the panel "**Data input and retrieval".**

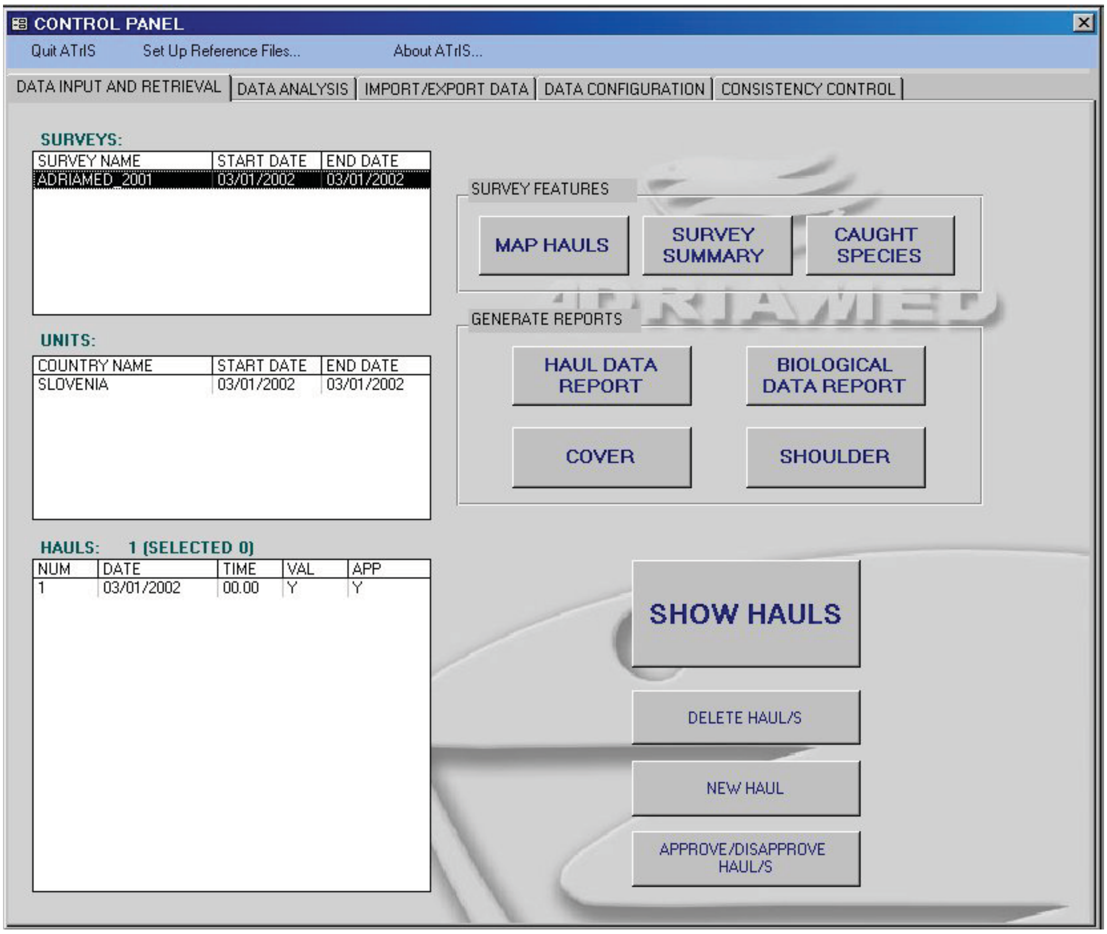
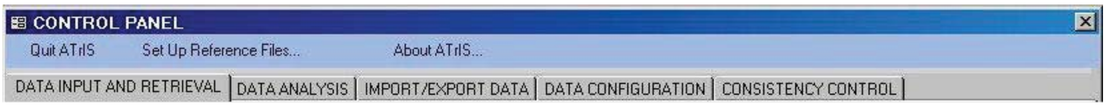


Figure 3.1. Control panel.



On the top of the CONTROL PANEL three options are always available:

--Quit ATrIS: it can be used to exit the application
--Set Up Reference Files: it visualize the Set Up Reference Files Table set during the SET UP (already illustrated in Chapter 2.4, point 4)
--About ATrIS: some information on the product.

Please note that:
--the button ESC on the keyboard can be used once to cancel the last action and twice to cancel the entire modification.
--if click twice on a field it is possible (if applicable) to change it.

4. Data Configuration

This section contains the general settings required to decode data (if applicable) and in the handling of data validation (see Chapter 5 *Data Input and Retrieval* and Chapter 8 *Consistency control*). The users can customize each code.

The operation of configuration should be run each time new survey data, with characteristics not yet codified, is inserted in the database (see also Chapter 6 for the inclusion of data for a survey already in the database). Table 4.1 presents the settings that may be modified or added, and in the following paragraphs the configuration procedure for each code is illustrated.

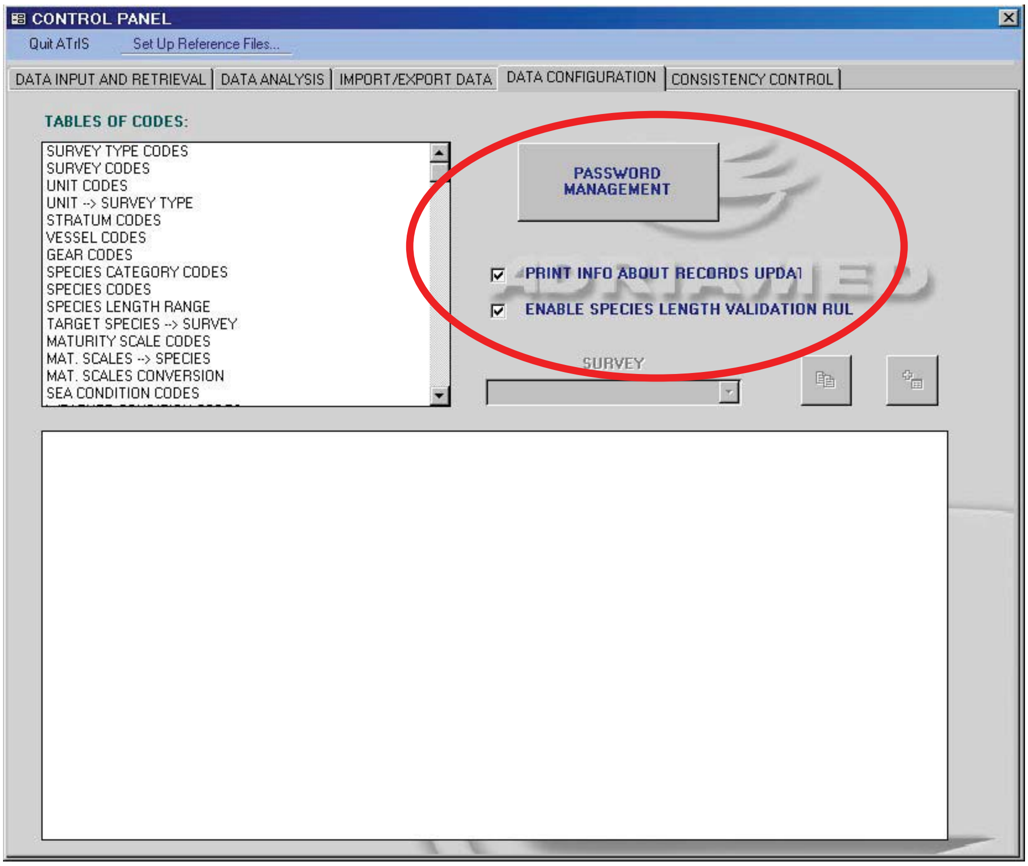
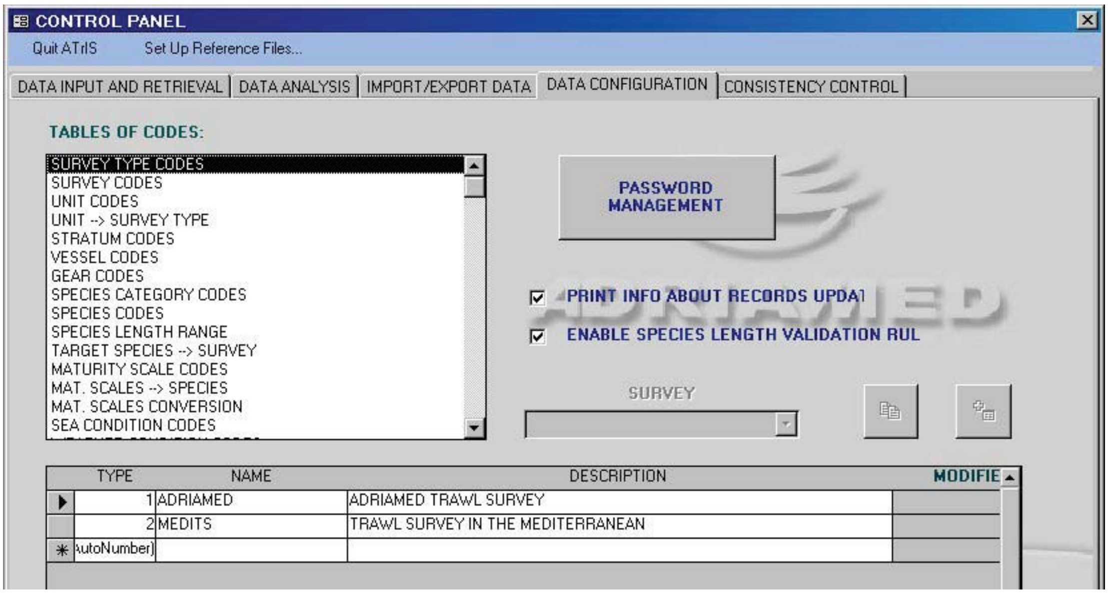


Table 4.1. List of the codes to be set.

Survey Type Codes	Species length range
Survey Codes	Target species-Survey
Unit Codes	Maturity scale Codes
Unit-Survey Type	Maturity Scale-Species
Stratum Codes	Maturity Scale Conversion
Vessel Codes	Sea Condition Codes
Gear Codes	Weather conditions Codes
Specie Category Codes	Bottom Shape Codes
Species Codes	

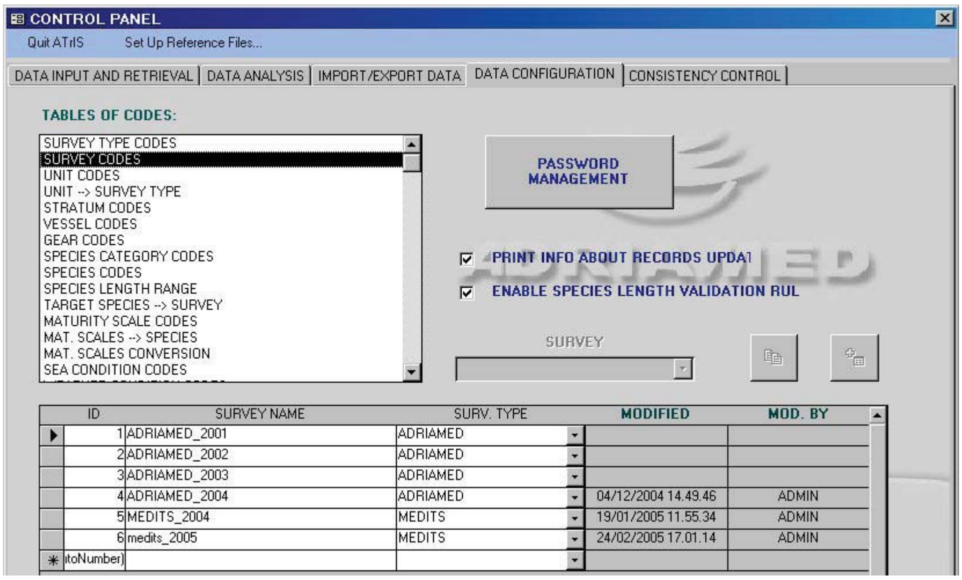
4.1 Survey Type Codes

A mask with three fields appears. Add the name or the acronym of the survey and a brief description of it. An ID number is automatically assigned to each survey added. For example the AdriaMed trawl surveys is given the name AdriaMed and a definition which repeats the name of the survey.



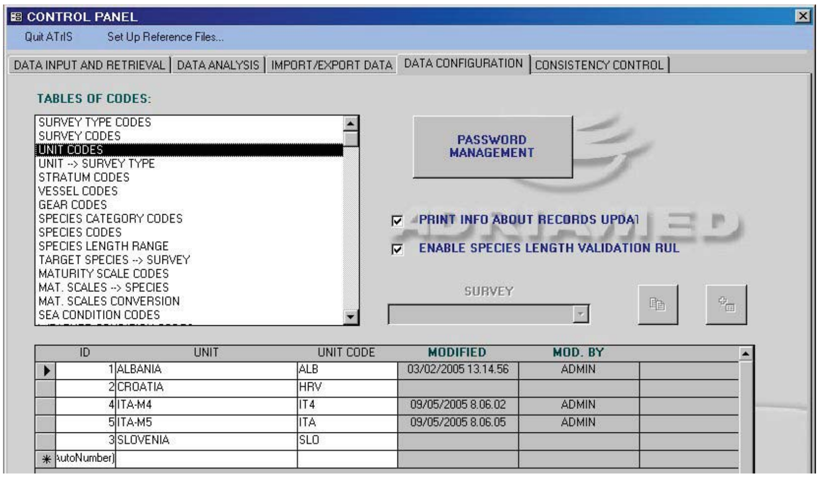
4.2 Survey Codes

This mask links the name of each survey to the type of survey. Add in the field survey name the complete name of the survey (e.g. AdriaMed 2001, AdriaMed 2002, etc.) and correlate a survey type to each survey name (i.e. AdriaMed 2001 is associated to the AdriaMed type of survey). Numerical ID will be automatically assigned to each survey name.



4.3 Unit Codes

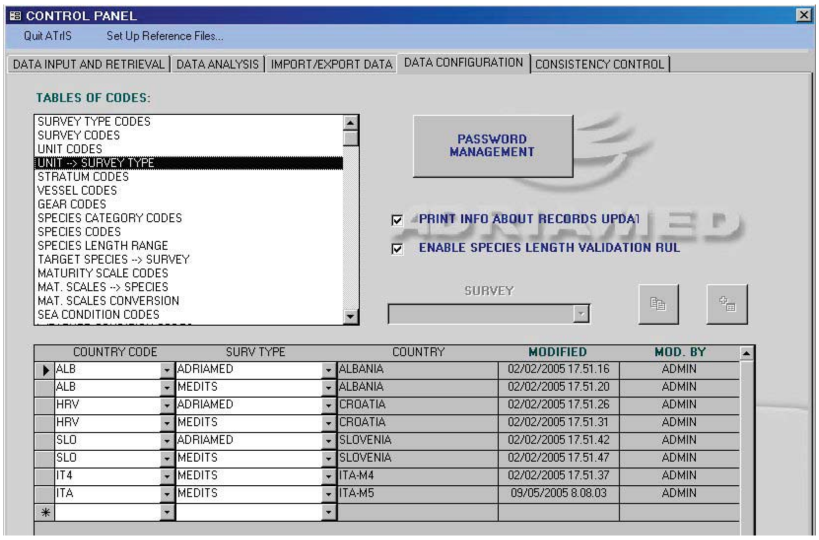
During a survey many institutions/countries (hereunder called "Unit") may participate in the investigation. This mask allows the users to associate each Unit which took part to the survey to the survey type field. Insert the name or acronym of each unit, add a code (in the Unit code field) to identify each Unit, select a survey type (if available) with the scroll bar to be associated to the unit.
If the scroll bar does not have the survey type to be associated with the unit code please check if the survey type codes you are looking for has been added in the survey type code field!



ID	UNIT	UNIT CODE	MODIFIED	MOD. BY
1	ALBANIA	ALB	03/02/2005 13.14.56	ADMIN
2	CROATIA	HRV		
4	ITA-M4	IT4	09/05/2005 8.06.02	ADMIN
5	ITA-M5	ITA	09/05/2005 8.06.05	ADMIN
3	SLOVENIA	SLO		
(AutoNumber)				

4.4 Unit-Survey Type

This mask combines the units with the survey type. Select in the COUNTRY CODE field the country (UNIT) to associate with a survey (select the survey in the scroll bar).



COUNTRY CODE	SURV TYPE	COUNTRY	MODIFIED	MOD. BY
ALB	ADRIAMED	ALBANIA	02/02/2005 17.51.16	ADMIN
ALB	MEDITS	ALBANIA	02/02/2005 17.51.20	ADMIN
HRV	ADRIAMED	CROATIA	02/02/2005 17.51.26	ADMIN
HRV	MEDITS	CROATIA	02/02/2005 17.51.31	ADMIN
SLO	ADRIAMED	SLOVENIA	02/02/2005 17.51.42	ADMIN
SLO	MEDITS	SLOVENIA	02/02/2005 17.51.47	ADMIN
IT4	MEDITS	ITA-M4	02/02/2005 17.51.37	ADMIN
ITA	MEDITS	ITA-M5	09/05/2005 8.08.03	ADMIN

4.5 Stratum Codes

This mask allows the definition of the strata in a survey. The following fields should be completed. The stratum field is thus linked to the Unit field code.
The AdriaMed trawl surveys strata were defined according to the following bathymetric limits: 10-50m, 50-100m, 100-200 m (GSA 17) and 200-500m and 500-800 m (GSA 18).

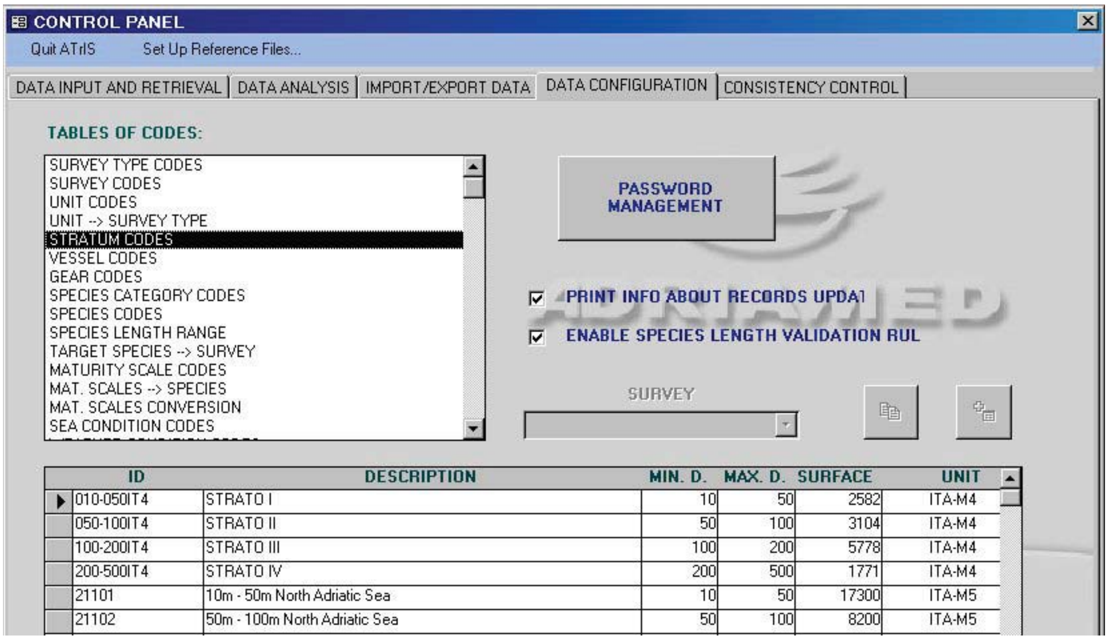
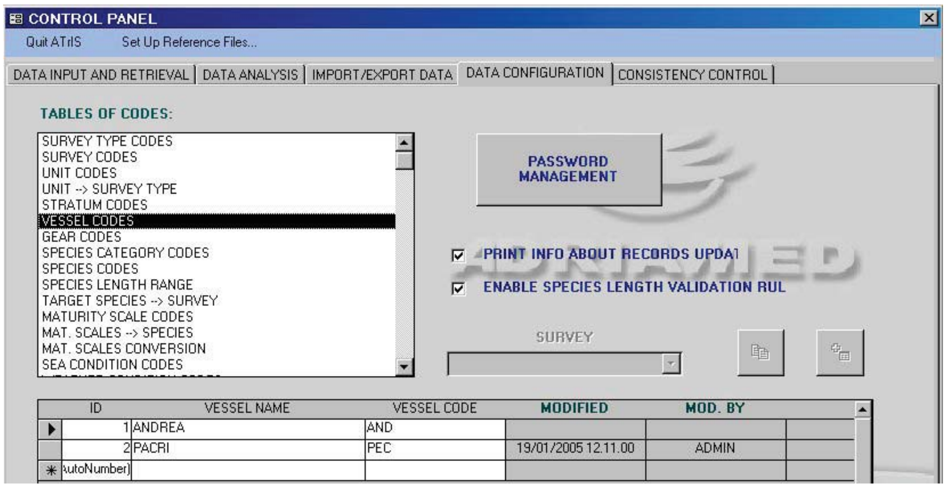


Table 4.2. List of fields in the Stratum Code mask.

Field	Description
ID	Add a numerical ID to the stratum (i.e. if using MEDITS protocol the stratum between 10 and 50 m in the North Adriatic has the ID 21101)
Description	Add a description of the stratum
Minimum depth	The minimum depth in meters registered for that stratum
Maximum depth	The maximum depth in meters registered for that stratum
Surface	The total surface (Km^2) covered by the stratum
Unit	Choose in the scroll bar the Unit associated to that stratum
Area	Add (if available) the zone in which the stratum is located

4.6 Vessel Codes

This mask provides the vessel name and a three letter vessel code.



4.7 Gear Codes

This mask records some technical details of the gear used in the trawl survey as follows. The horizontal and vertical spread are necessary to estimate the haul length (see Chapter 6, para 6.3.4.3 for the calculation of haul length).

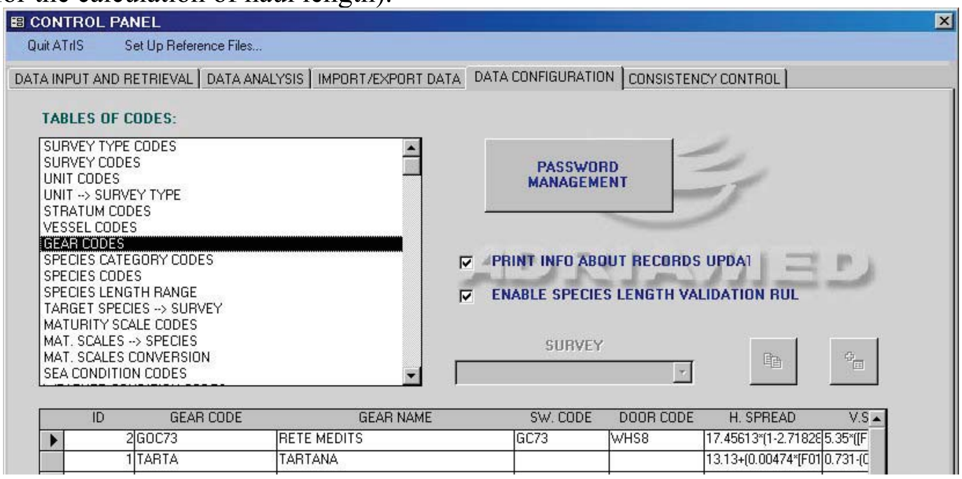
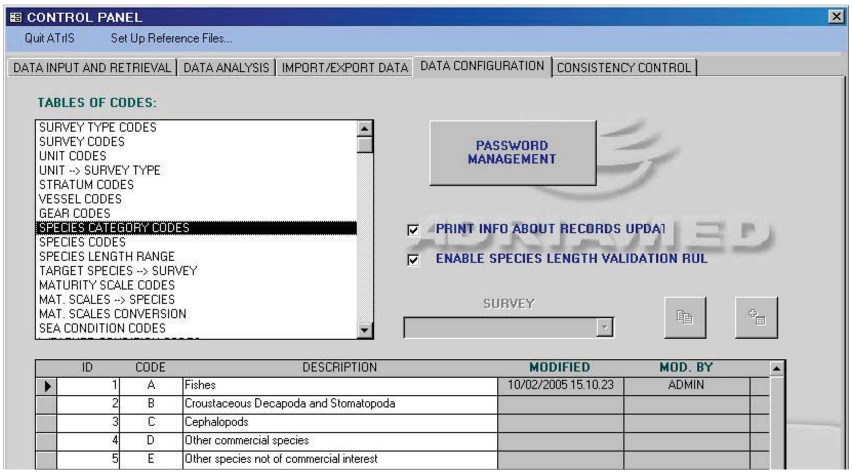


Table 4.3. List of fields in the Gear Code mask.

Field	Description
ID Code	The system assigns automatically a numerical ID
Gear Code	Add a code to the gear (five letter or numeric code)
Gear name	Add the name of the gear
SW code	Add a four letter code for the sweep type
Door Code	Add a four letter code for the door type
Horizontal Spread	The horizontal spread of the net mouth (meters)
Vertical Spread	The vertical spread of the net mouth (meters)
Survey Type	Choose in the scroll bar the survey type to be associated with the gear

4.8 Species Category Codes

This mask contains the table with the description of each taxonomic code, as reported in the MEDITS protocol. The MEDITS codes for each taxonomic group are the following:
A= Fish
B = Crustacea (Decapoda and Stomatopoda)
C = Cephalopods
D = Other commercial species
E = Other animal, non commercial species



4.9 Species Codes

Users may customize a table of codes through this mask, using the MEDITS codes for the species name (Bertrand, 1995). The table of codes may be edited as required and new species can be added. A list of 648 scientific names is already registered in the database. Note that the scientific names in the table of codes are not validated by AdriaMed. It is the user's responsibility to ensure that these names are correct. The coefficient a and b of the length-weight relationship equation, although not a required input, are necessary to extrapolate length/weight if only weight/length data are available.

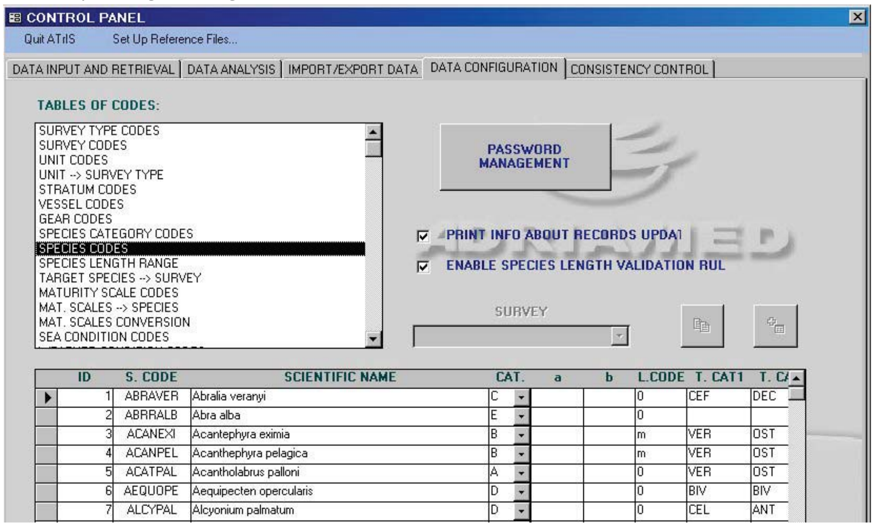
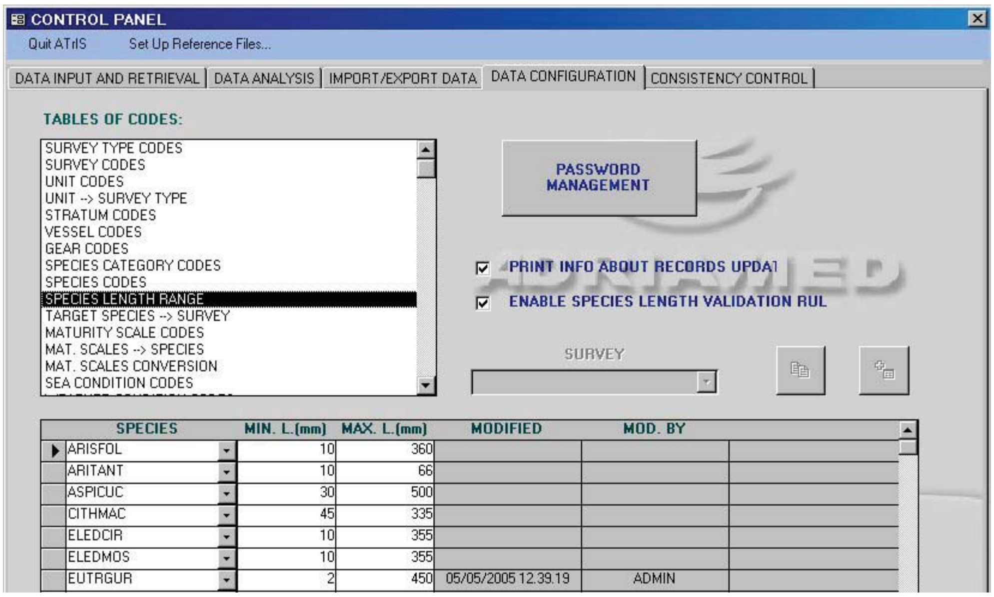


Table 4.4. List of fields in the scientific name Code mask.

Field	Description
ID	The system assigns automatically a numerical ID
Species Code	The seven letter code MEDITS for the species
Scientific name	The scientific name of each species
Category	The code MEDITS for each taxonomic group (i.e. A= Fish B = Crustacea (Decapoda and Stomatopoda) C = Cephalopods D = Other commercial species E = Other animal non commercial species)
a	The coefficient a in the Length-weight relationship equation ($W = aL^b$)
b	The coefficient b in the Length-weight relationship equation ($W = aL^b$)
Length Code	The MEDITS code for length interval
Taxonomy category 1	The taxonomic category at phylum level (Vertebrata, Mollusca, etc.)
Taxonomy category 2	The taxonomic category at subphylum or class level (Osteichthyes Gastropoda, etc)

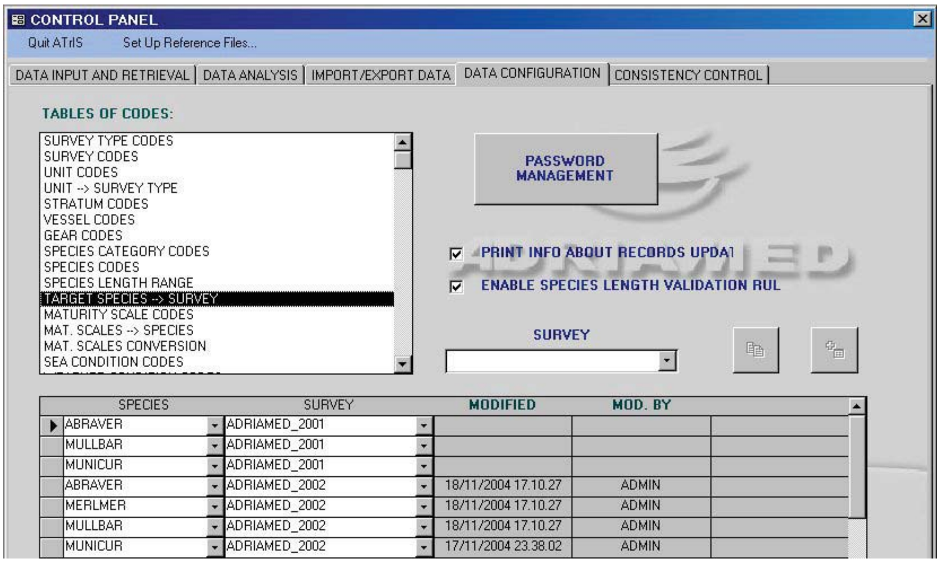
4.10 Species Length Range

ATrIS contains some features to control consistency of data: when an anomalous value is recorded the system is able to reveal it and gives an error message. One of the configuration on which the error control is based is the range of length for a species: determining the minimum and maximum length of a certain species (e.g. *Merluccius merluccius*, LEN. MIN. 1 mm, LEN.MAX 1500 mm) the system is able to detect a strange value (e.g. a length 2000 mm for *Merluccius merluccius*)

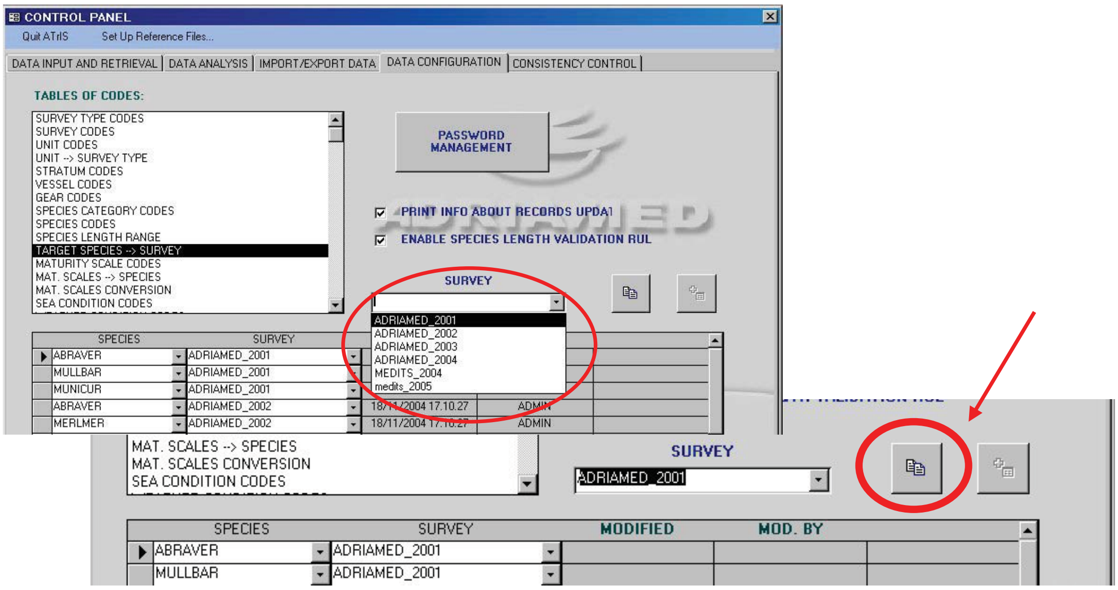


4.11 Target species-Survey

In each survey a list of target species list is available. This mask allows users to add a target species using the scroll bar SPECIES: the list of all the species inserted in the database will be available. Pick up the species, which is to be considered target, in the SPECIES scroll bar and in the scroll bar SURVEY select the survey in which the species is target. This operation should be repeated for each target species.

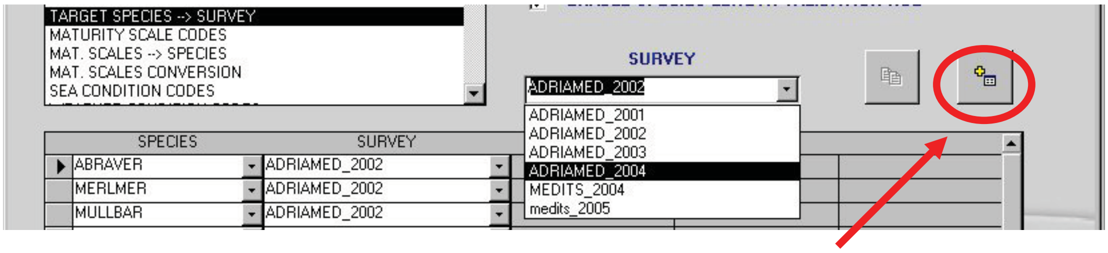


Another way to add target species for a new survey is the following. In the scroll bar SURVEY select a survey with the same (or very similar) target species list of the survey to be added. A button COPY will be activated.



Click on the button COPY: the data will be automatically copied and the button PASTE will be activated. Select the new survey from the scroll bar and press the button PASTE.

Automatically the list of the target species of the old survey will be pasted and associated to the new survey.



4.12 Maturity scale Codes

Users may define the maturity scale by completing this table (Table 4.5). In the field maturity scale code a five letter code should be added to identify the maturity scale used. Please note that when the same taxa have different maturity scale for each sex a maturity scale code should be added (i.e. for the family of Penaeideae the maturity scale MEDITS is available just for the females).

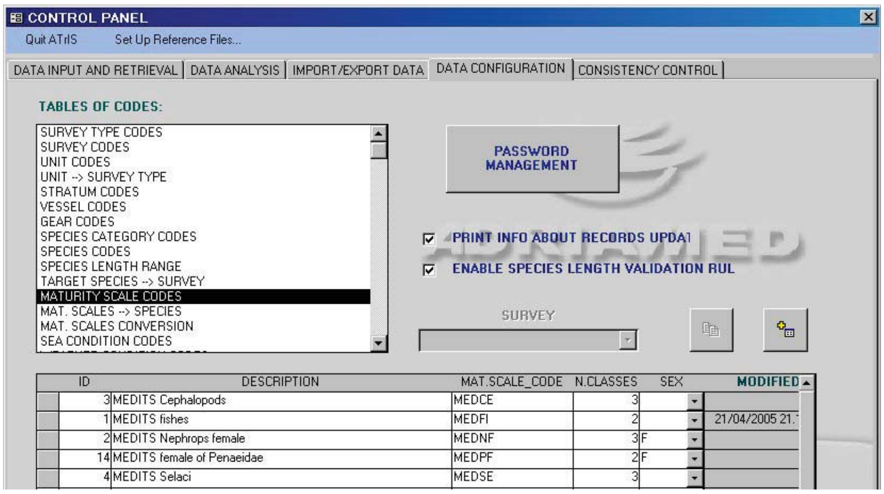
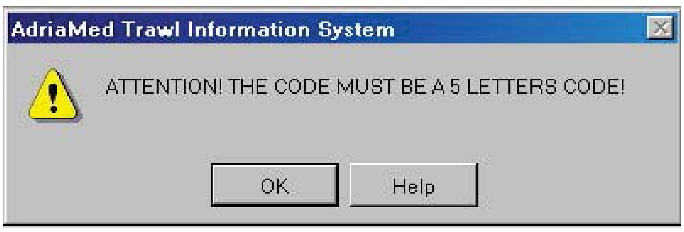


Table 4.5. List of fields in the Maturity scale code mask.

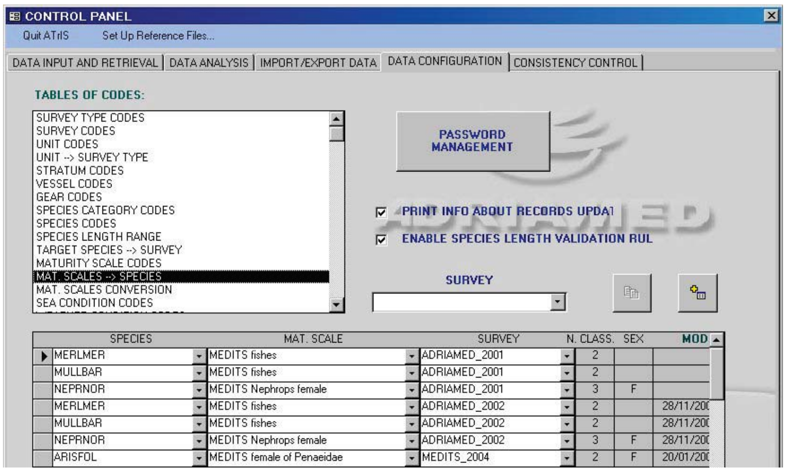
Field	Description
ID	The system automatically assigns numerical ID
Description	Add a brief description of the maturity scale
Maturity scale Code	Add a five digit code to identify the maturity scale
Number of classes	Indicate the number of classes allowed by the maturity scale chosen
Sex	Indicate the sex for which the maturity scale is available

Please note that if the Maturity scale Code inserted is not a five digit code the system will display the following error message.

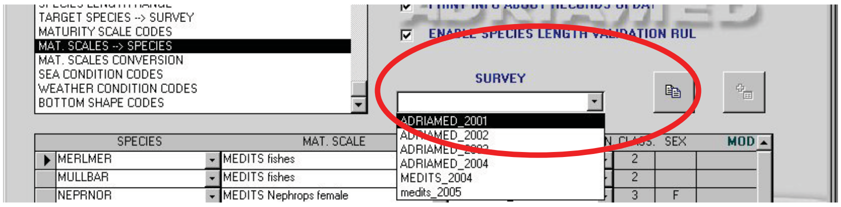


4.13 Maturity Scale-Species

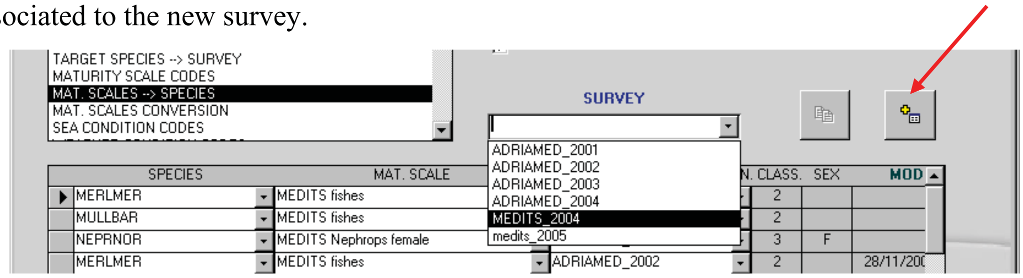
This mask is strictly associated to the previous and allows to link each maturity scale to a species for and a survey. For each species for which a maturity scale is available, a survey should be associated.



Another way to link a species to a maturity scale is the following (see also para 4.10). In the scroll bar SURVEY select a survey with the same (or very similar) species list/maturity scale of the survey to be added. A button COPY will be activated.



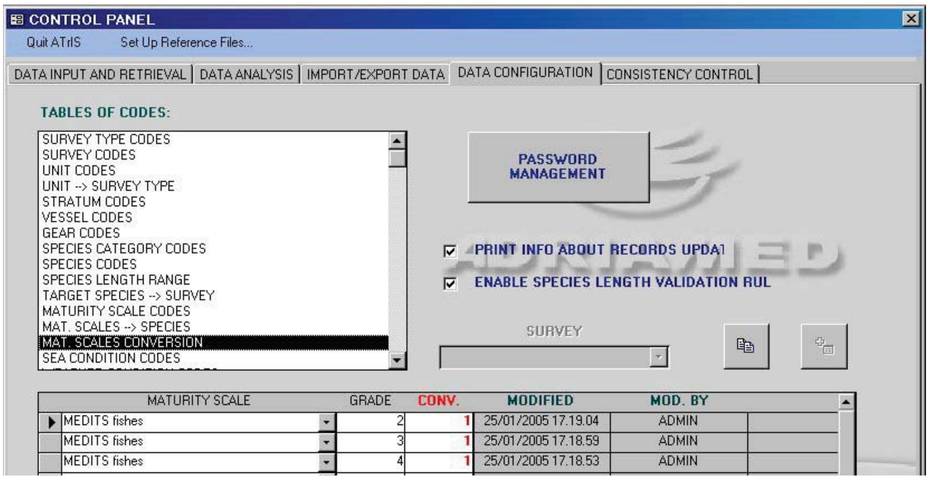
Click on the button COPY: the data will be automatically copied and the button PASTE will be activated. Select the new survey from the scroll bar and press the button PASTE. Automatically the list of the species/maturity scale of the old survey will be pasted and associated to the new survey.



4.14 Maturity Scale Conversion

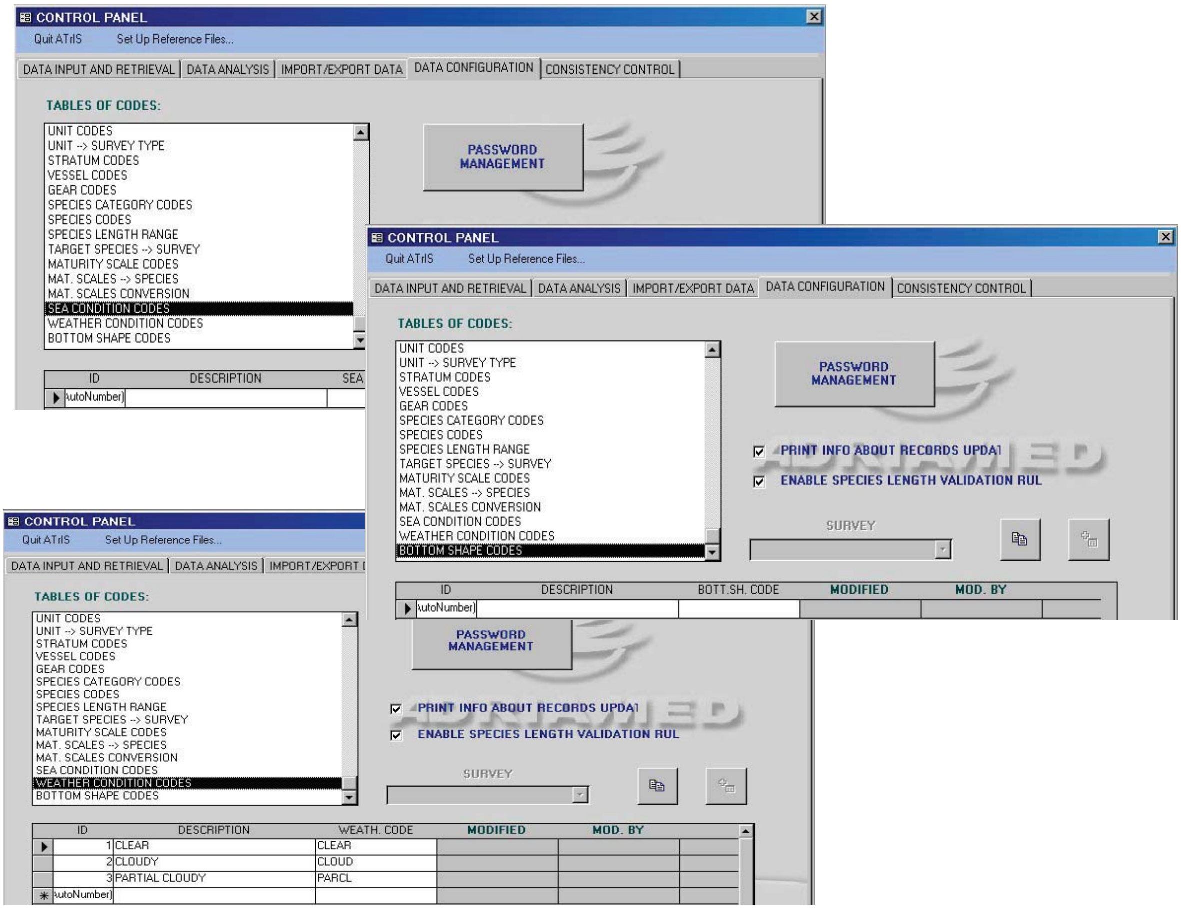
This is the last mask related to the maturity scale. It allows users to convert the update or modify a maturity scale used for another scale. For example if the maturity scale applied to fish allowed three stages and a new fourth stage has been discovered, all the fish with stage 3 should be converted into 4 stage maturity. It is necessary to indicate in the table the maturity

scale to be converted, indicate one by one the maturity stage of the scale and indicate the new converted stage to be assigned.



4.15 Sea Condition Codes, Weather conditions Codes and Bottom Shape Codes

These masks are related to the climatic and topographic conditions during the survey. Each table has the same structure: an ID automatically given, the description of the code, and the code to be assigned (preferably a four letter code). The users can customize or add new voices to these tables.



4.16 Data management

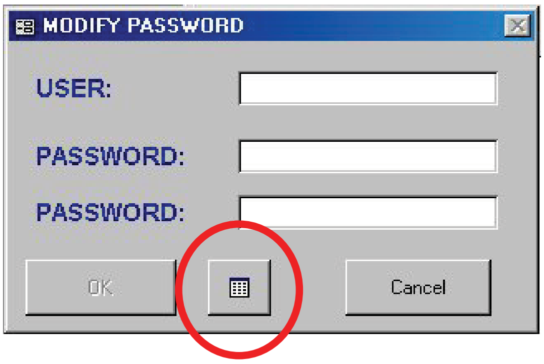
On the right side of the panel there are three options to configure/manage data:
--Password management
--Print info about records update
--Enable species length validation rules

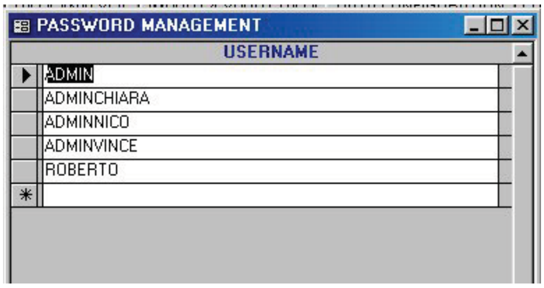
4.16.1 Password management (only for Administrators)

Only the administrator is allowed access to the data management is. To create an Administrator account please insert the prefix ***admin*** to the user field. The administrator may control/change the passwords of users. By clicking on the button PASSWORD MANAGEMENT a window will be opened. Insert the user name, the old password in the first field and the new password in the second field. The button on the bottom of the window will show the list of all the users allowed to access ATrIS.

Users can not manage, then modify the passwords.

The Administration account has some additional capabilities on data configuration and it can approve/disapprove a hauls (see Chapter 6, para 6.3).





4.16.2 Print info about records update

ATrIS includes useful features to generate reports as illustrated in the following paragraphs. Users can define if a report should contains information on the management of records (the modifications, who made the modification, the date of the modification etc.)



4.16.3 Enable species length validation rules

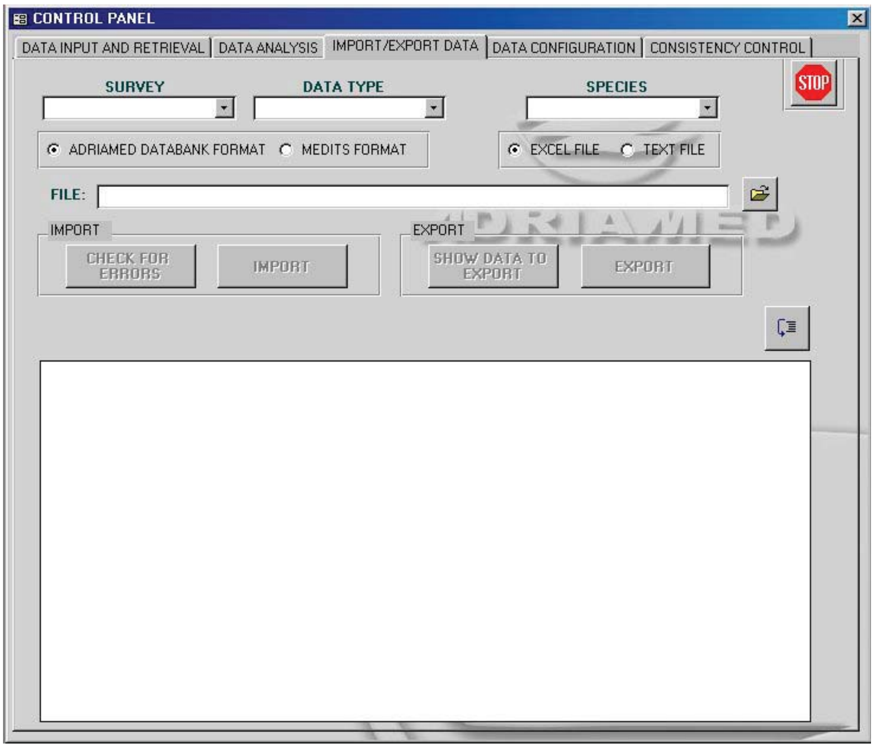
One of the data consistency controls is based on the species length range: if a range of length, minimum and maximum length, is defined for a species, it is easy to control if a single specimens has a length value outside the fixed range. This control is setup by default but

there could be the necessity to disable this option by click on the check on the DATA CONFIGURATION Panel.



5. Import/export data

The system permits to import data from other databases or sets of data. The Import/Export panel allows the users for the exchange of data to/from AdriaMed Excel based database and MEDITS. The AdriaMed Databank format is based on Excel files while the MEDITS data are recorded as simple text files.



5.1 Import data

Once the Set up has been carried out (see chapter 4), the records which have been downloaded on to a diskette or in a directory of your PC in a file may be imported on to the ATrIS System.

<u>Please note that the import procedures should be started only if Set-Up has been completed.</u>

Hereunder the procedures of import for the AdriaMed data or MEDITS data are illustrated. ATrIS recognize the AdriaMed databank format (.xls files) and MEDITS formats (.xls files and txt.files). The following six steps must be followed:

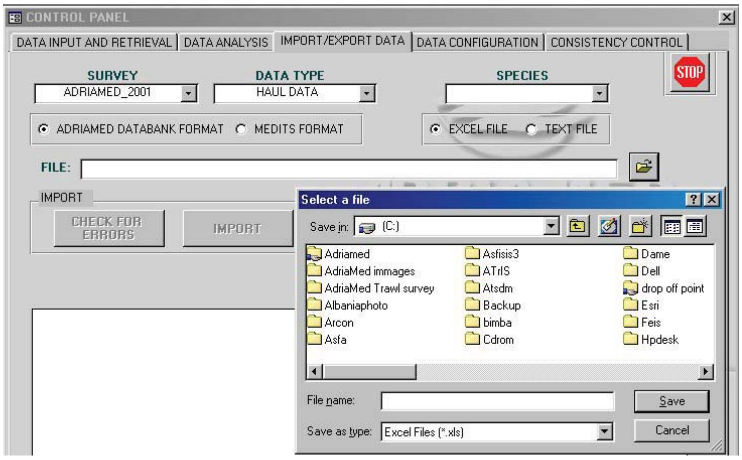
1. Choose the Survey

Select using the scroll bar the corresponding survey to the data to be imported (field SURVEY)

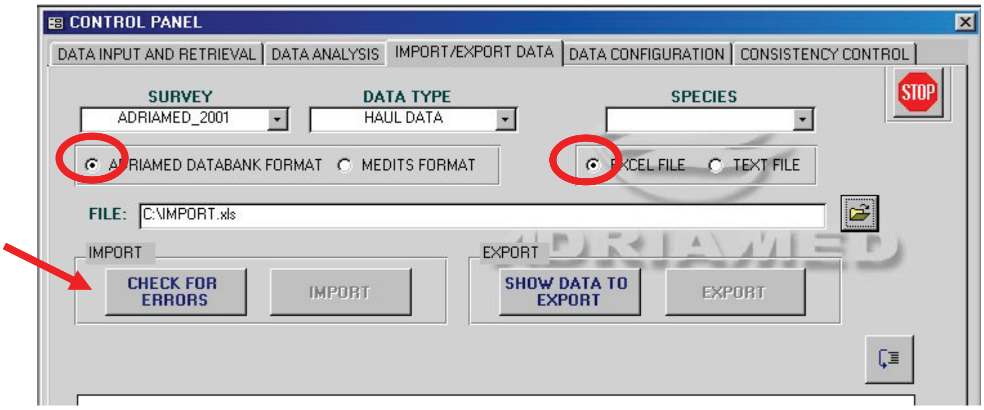
2. Choose the type of data you want to import

Indicate in the field DATA TYPE using the scroll bar if the data to be imported are haul, catch or biological data. (see para 5.2 and 5.3)

3. *Choose the species you want to limit the import procedure (if applicable)*
   Using the scroll bar indicate one species in the field SPECIES to limit the data to import only to that species
4. *Indicate the file name*



5. *Select the format type*
   Click on the check for AdriaMed Databank format or MEDITS format. Both the Import/Export button procedures will be activated.

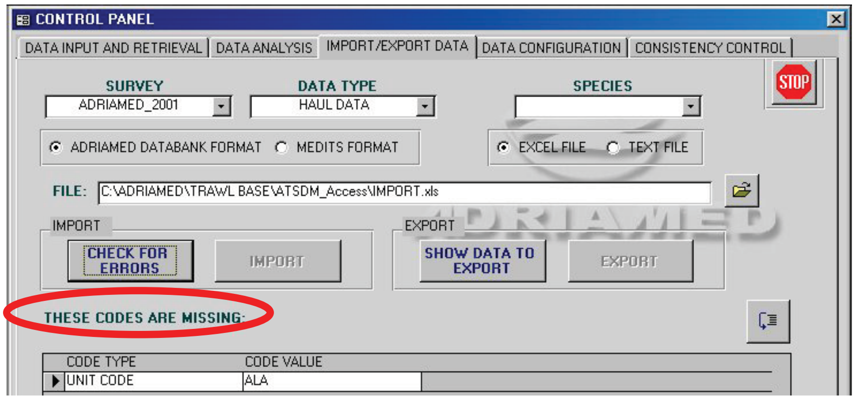


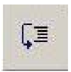
6. *Select the file type (Excel file or Text file)*

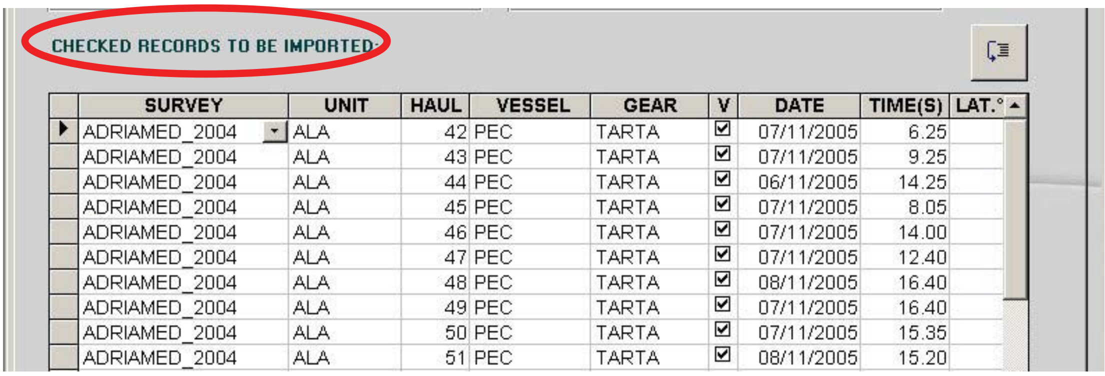
7. *Follows the indication in para 5.2 if choosing AdriaMed Databank format or para 5.3 if choosing MEDITS format.*

8. *Click on CHECK for Errors.* The system will start to check the data for errors. A series of messages will be displayed: the type of error and the location (row and/or column) will be indicated. If error/s occurs, please
   a) read the message,
   b) reopen the original file,
   c) check for the error the original file,
   d) remove the error/s,
   e) save the file and then

f) repeat the import procedure from step 1.



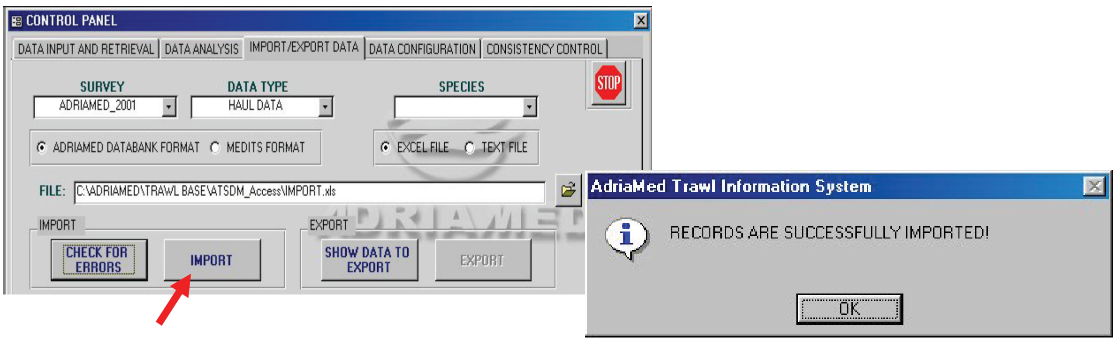
The button  visualizes the records to be imported.
Once the control checking has been ultimate the system gives a green message and displays the records to be imported.



SURVEY	UNIT	HAUL	VESSEL	GEAR	V	DATE	TIME(S)	LAT.°
ADRIAMED_2004	ALA	42	PEC	TARTA	☑	07/11/2005	6.25	
ADRIAMED_2004	ALA	43	PEC	TARTA	☑	07/11/2005	9.25	
ADRIAMED_2004	ALA	44	PEC	TARTA	☑	06/11/2005	14.25	
ADRIAMED_2004	ALA	45	PEC	TARTA	☑	07/11/2005	8.05	
ADRIAMED_2004	ALA	46	PEC	TARTA	☑	07/11/2005	14.00	
ADRIAMED_2004	ALA	47	PEC	TARTA	☑	07/11/2005	12.40	
ADRIAMED_2004	ALA	48	PEC	TARTA	☑	08/11/2005	16.40	
ADRIAMED_2004	ALA	49	PEC	TARTA	☑	07/11/2005	16.40	
ADRIAMED_2004	ALA	50	PEC	TARTA	☑	07/11/2005	15.35	
ADRIAMED_2004	ALA	51	PEC	TARTA	☑	08/11/2005	15.20	

9. Import records by clicking on IMPORT button.

All the records will be definitively imported and automatically they will no longer be displayed in the windows below; the button IMPORT will be deactivated. A message box will alert to the successful import.



<u>Please note that to import haul data, catch data, and biological data the import procedures should be run three times.</u>

5.2 AdriaMed Databank format (Excel file)

The AdriaMed Trawl Survey Databank has been used to store/analyse the data of the AdriaMed Trawl survey 2001 and 2003 (Milone *et al*., 2004). The Databank was an Excel based system. Therefore there would be the need to export from that system the data and import them to the ATrIS system. However it is essential that some of the parameters are changed to ensure that the AdriaMed Databank records are converted in a format compatible with the ATrIS application.

<u>Please note that to import the AdriaMed Databank format (Excel files only), the structure of a record should be modified using the following rules:</u>

1. Open the AdriaMed Databank Excel file.

2. Rename the Excel spreadsheet into:

AdriaMed format	ATrIS format
Haul	HAUL
Catch	CATCH
Length distribution	BIOLOGICAL

Be sure that the columns appear in the same order as reported in para 3.1.1 for the haul data, in para 3.1.2 for the catch data and in para 3.2.3 for the biological data.

Please verify that the blank rows/columns below the records are truly unfilled: if the system reveals a formatting or a cell that is not clear during the import procedures the blank row/column will be counted and the system will display an error message indicating "Invalid Use of Null". In this case delete all the blank rows/column.

The file can now be imported to ATrIS. Follows the procedures already indicated in para 5.1.

5.3 MEDITS format

ATrIS allows the import of the MEDITS data. The procedure for importing MEDITS records are similar to that described in para 5.2 for the AdriaMed Databank format.

ATrIS detect two MEDITS formats: EXCEL format and ASCII format.

5.3.1 EXCEL format

This option may be used when there is a need to import MEDITS data in an EXCEL format. Use the TA TB and TC files. The procedure then is as follows:

1. Open the TA, TB, TC.dbf files using Excel. Save the TA, TB, TC as Excel files (xls extension).

2. Rename the Excel spreadsheet into:

MEDITS format	ATrIS format
TA	HAUL
TB	CATCH
TC	BIOLOGICAL

Please note that the field YEAR for the MEDITS procedure up to 1999 is a two digit number field. ATrIS uses a four digit code for the YEAR field.

3. Select the type of survey (SURVEY) and the type of data (DATA TYPE) to be imported. If the import procedure would be limited to one species please specify the species name using the scroll bar SPECIES.

Please note that to import haul data, catch data and biological data the import procedures should be run three times.

4. Once steps 1 and 2 are completed indicate the source file and specify the format type (click on the check available, i.e. MEDITS format and Excel file). Both the Import/Export button procedures will be activated.

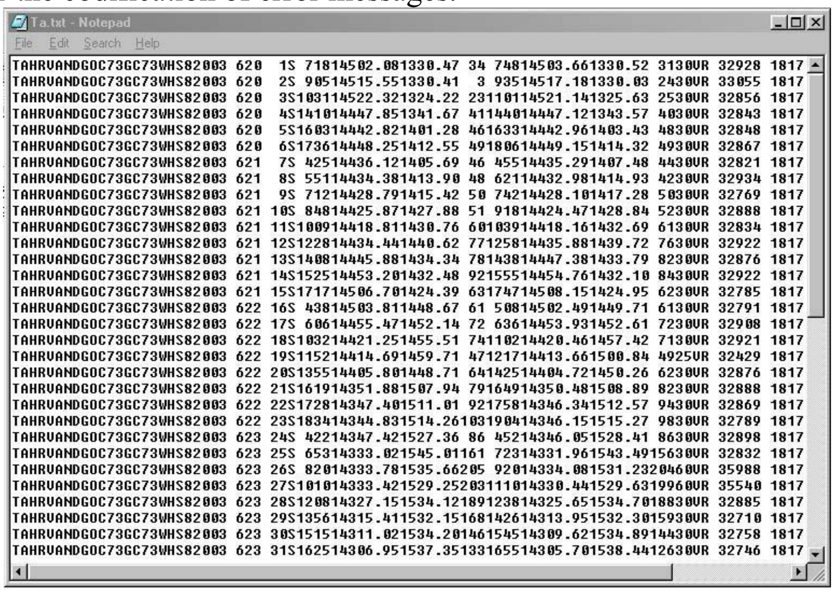
5. Click on CHECK FOR ERRORS and the system will start to check the data for errors.

6. Once all the errors have been removed (see para 5.2, point 5) and the import procedure is completed the system gives a green message. The list of the records to be imported will be shown.

7. Click on the IMPORT button.

5.3.2 ASCII (text) format

The text MEDITS format import procedure is very simple as the ATrIS system recognizes the format as it is released from MEDITS. However some problems may occur, in this case see para 5.4 for the codification of error messages.




```
TAHRVANDGOC73GC73WHS82003 620  1S 71814502.081330.47 34 74814503.661330.52 3130VR 32928 1817
TAHRVANDGOC73GC73WHS82003 620  2S 90514515.551330.41  3 93514517.181330.03 2430VR 33055 1817
TAHRVANDGOC73GC73WHS82003 620  3S103114522.321324.22 23110114521.141325.63 2530VR 32856 1817
TAHRVANDGOC73GC73WHS82003 620  4S141014447.851341.67 41144014447.121343.57 4030VR 32843 1817
TAHRVANDGOC73GC73WHS82003 620  5S160314442.821401.28 46163314442.961403.43 4830VR 32848 1817
TAHRVANDGOC73GC73WHS82003 620  6S173614448.251412.55 49180614449.151414.32 4930VR 32867 1817
TAHRVANDGOC73GC73WHS82003 621  7S 42514436.121405.69 46 45514435.291407.48 4430VR 32821 1817
TAHRVANDGOC73GC73WHS82003 621  8S 55114434.381413.90 48 62114432.981414.93 4230VR 32934 1817
TAHRVANDGOC73GC73WHS82003 621  9S 71214428.791415.42 50 74214428.101417.28 5030VR 32769 1817
TAHRVANDGOC73GC73WHS82003 621 10S 84814425.871427.88 51 91814424.471428.84 5230VR 32888 1817
TAHRVANDGOC73GC73WHS82003 621 11S100914418.811430.76 60103914418.161432.69 6130VR 32834 1817
TAHRVANDGOC73GC73WHS82003 621 12S122814434.441440.62 77125814435.881439.72 7630VR 32922 1817
TAHRVANDGOC73GC73WHS82003 621 13S140814445.881434.34 78143814447.381433.79 8230VR 32876 1817
TAHRVANDGOC73GC73WHS82003 621 14S152514453.201432.48 92155514454.761432.10 8430VR 32922 1817
TAHRVANDGOC73GC73WHS82003 621 15S171714506.701424.39 63174714508.151424.95 6230VR 32785 1817
TAHRVANDGOC73GC73WHS82003 622 16S 43814503.811448.67 61 50814502.491449.71 6130VR 32791 1817
TAHRVANDGOC73GC73WHS82003 622 17S 60614455.471452.14 72 63614453.931452.61 7230VR 32908 1817
TAHRVANDGOC73GC73WHS82003 622 18S103214421.251455.51 74110214420.461457.42 7130VR 32921 1817
TAHRVANDGOC73GC73WHS82003 622 19S115214414.691459.71 47121714413.661500.84 4925VR 32429 1817
TAHRVANDGOC73GC73WHS82003 622 20S135514405.801448.71 64142514404.721450.26 6230VR 32876 1817
TAHRVANDGOC73GC73WHS82003 622 21S161914351.881507.94 79164914350.481508.89 8230VR 32888 1817
TAHRVANDGOC73GC73WHS82003 622 22S172814347.401511.01 92175814346.341512.57 9430VR 32869 1817
TAHRVANDGOC73GC73WHS82003 622 23S183414344.831514.26103190414346.151515.27 9830VR 32789 1817
TAHRVANDGOC73GC73WHS82003 623 24S 42214347.421527.36 86 45214346.051528.41 8630VR 32898 1817
TAHRVANDGOC73GC73WHS82003 623 25S 65314333.021545.01161 72314331.961543.4915630VR 32832 1817
TAHRVANDGOC73GC73WHS82003 623 26S 82014333.781535.66205 92014334.081531.2320460VR 35988 1817
TAHRVANDGOC73GC73WHS82003 623 27S101014333.421529.25203111014330.441529.6319960VR 35540 1817
TAHRVANDGOC73GC73WHS82003 623 28S120814327.151534.12189123814325.651534.7018830VR 32885 1817
TAHRVANDGOC73GC73WHS82003 623 29S135614315.411532.15168142614313.951532.3015930VR 32710 1817
TAHRVANDGOC73GC73WHS82003 623 30S151514311.021534.20146154514309.621534.8914430VR 32758 1817
TAHRVANDGOC73GC73WHS82003 623 31S162514306.951537.35133165514305.701538.4412630VR 32746 1817
```

The import procedure is the same as illustrated in para 5.1 and it is reported below:

1. Select the type of survey (SURVEY) and the type of data (DATA TYPE) to be imported. If the import procedure is limited to one species please specify the species name using the scroll bar SPECIES.

2. Indicate the source file and specify the format type (click on the check available, i.e. MEDITS format and Text file). Both the Import/Export button procedures will be activated.

4. Click on CHECK FOR ERRORS and the system will start to check the data for errors.

5. Import data file.

Please note that to import haul data, catch data and biological data the import procedures should be run three times.

5.4 Codification of errors messages

This paragraph is intended to show the most frequent errors that could appear during the import procedures, it does not cover all the error types.

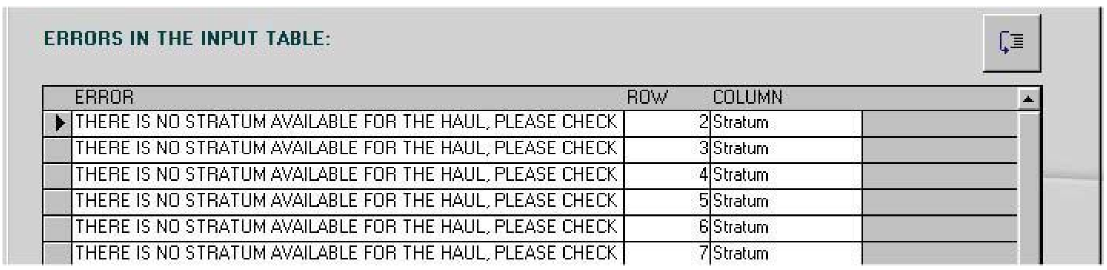
Error messages are displayed when the information required to import/export data is incomplete. If an error occurs, please read the message, reopen the original file, check for the error, remove the error(s), save the file and then repeat the import procedure from step 1 (as described in Chapter 5, para 5.1).

To facilitate the reading of the chapter the errors have been divided into five categories:
-General errors
-Syntax errors
-No correspondence error
-X errors
-Red errors

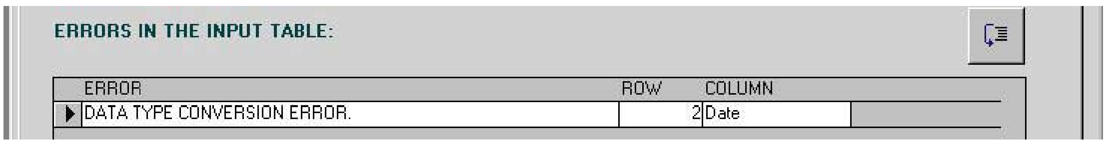
5.4.1 General Errors

A series of general messages could be displayed.

When decoding the haul, a stratum should be allocated. If the message below is shown the code used could be not correct or missing: please control in the SET UP panel and in the original file. For example an incorrect stratum e.g. 21116 (10-50 m) has been associated to a haul carried out in a 62 m depth station, or the column stratum could be empty.

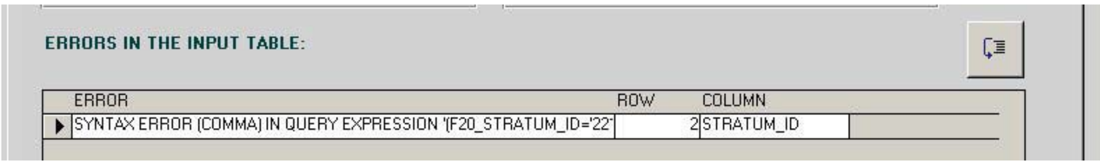


If the data inserted in the original file do not follow the rules for the import procedures, a message could appear as shown below. For example the date is written in a different format (dd/mm/yy and not dd/mm/yyyy), or the latitude is given without the indication of the direction (N or E)..etc.



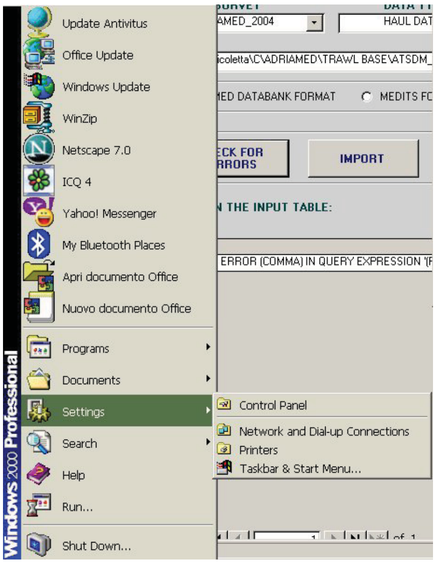
5.4.2 Syntax Errors

If the error shown in the mask below appears, please control that the settings of your PC are International Settings.



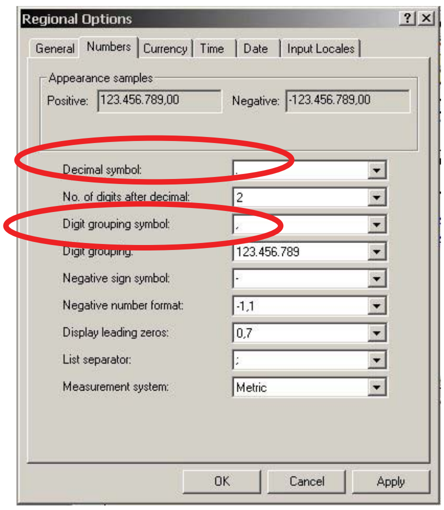
To control or modify the PC settings for the numbers follows the step:

1) Click on START of your PC and select Settings
2) Chose CONTROL PANEL
3) In CONTROL PANEL window select Regional Options





In Regional Options select the mask Number and modify the Decimal Symbol in a dot (.) and Digit grouping symbol in a comma (,).



5.4.3 No Correspondence Errors

This type of error occurs each time there is no correspondence in the SET UP configuration and the record included in the file. Some examples follow.

For example if there is no correspondence between the stratum code and the depth an error message will appear (e.g. the mean depth is 160 and the MEDITS stratum associated in the file is 22144 (200-500 m) instead the value to be indicate should be 22143 (100-200 m).

ERRORS IN THE INPUT TABLE:

ERROR	ROW	COLUMN
NO CORRESPONDANCE BETWEEN STRATUM AND DEPTH	12	STRATUM_ID

There could be no correspondence between the UNIT and the SURVEY TYPE. For example if a unit is recorded in both the AdriaMed survey type or MEDITS survey type attention should be paid to allocate the UNIT correctly: this could be the case of Albania, recorded in both the survey type. In the example below the error occurs in different rows but in the same column, the COUNTRY_CODE column. Probably during the Set Up the UNIT (COUNTRY_CODE column) has not been associated to a SURVEY.

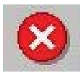
ERRORS IN THE INPUT TABLE:

ERROR	ROW	COLUMN
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	2	Country_CODE
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	3	Country_CODE
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	4	Country_CODE
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	5	Country_CODE
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	6	Country_CODE
NO CORRESPONDANCE BETWEEN UNIT AND SURVEY TYPE	7	Country_CODE

In the example below there is no correspondence between the sex indicated and the maturity scale used (e.g. a female *Nephrops norvegicus* with a maturity stage 4 will be not accepted if the maturity scale for female Penaeidae used is a three stage scale). In this case check if the value inserted is correct or control in the SET UP panel if the maturity scale used is correct.

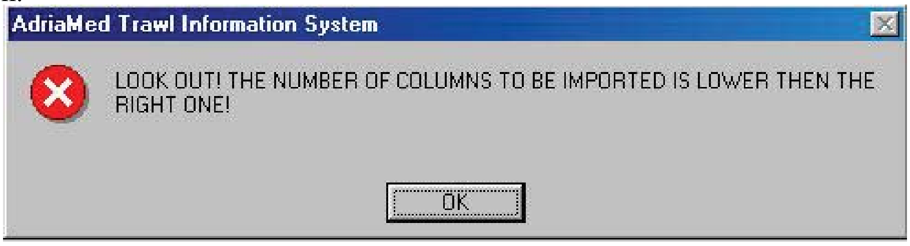
ERRORS IN THE INPUT TABLE:

ERROR	ROW	COLUMN
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	17	MATURITY SCALE
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	18	MATURITY SCALE
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	19	MATURITY SCALE
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	20	MATURITY SCALE
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	21	MATURITY SCALE
NO CORRESPONDANCE BETWEEN SPECIES, SEX, AND MATURITY	22	MATURITY SCALE

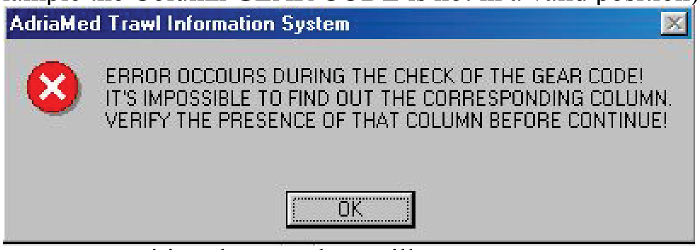


5.4.4 X Errors

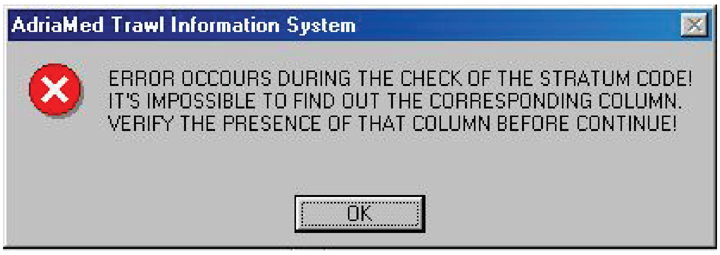
If the number of column is lower than that indicated in Chapter 3, the following message will be shown.



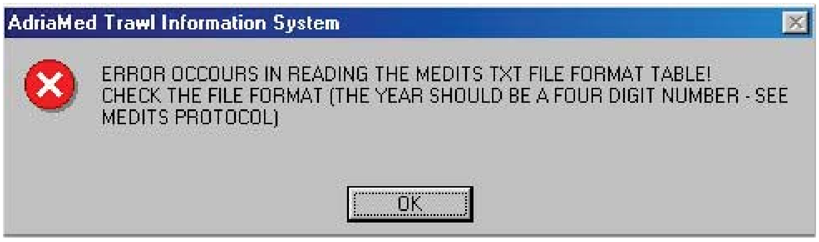
If an error occurs in a field, the system will indicate the column in which the error has been detected (in the example the Column GEAR CODE is not in a valid position).



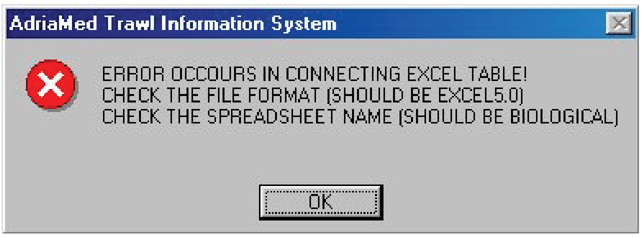
If a column is the a wrong position the error box will appear.



When importing MEDITS format data in a .txt file the message below could appear: the MEDITS Protocol uses a two digit code (99) for the YEAR field however the ATrIS System needs a four digit number code (1999).

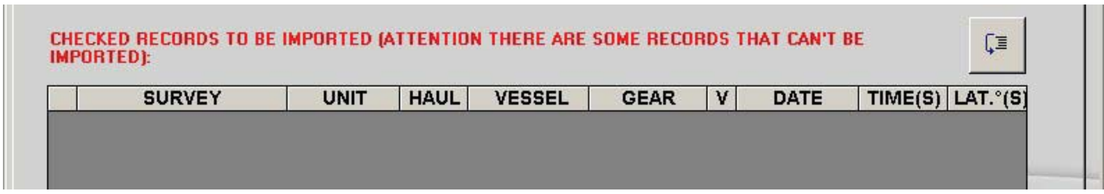


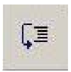
If the spreadsheet has a different name from that indicated in the AdriaMed Databank Format the following error will be displayed (In the example the spreadsheet biological had another name).



5.4.5 RED ERRORS

During the import procedure when a first control on the error has been carried out the system informs on the type of records it is going to import.



Click on the button  and the list of all the records to be imported will be shown.

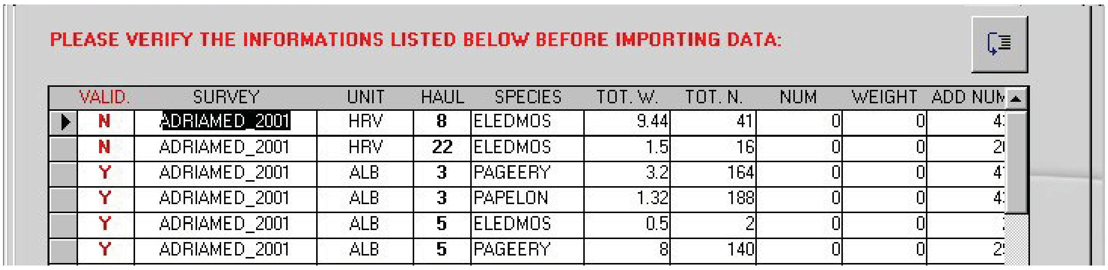
If the import procedure found repeated records the list of the double records will be displayed.



RECORDS ALREADY PRESENT IN THE DATABANK:

SURVEY	UNIT	HAUL	VESSEL	GEAR	V	DATE	TIME(S)	LAT.°
ADRIAMED_2004	ALA	3	PEC	TARTA	☑	07/11/2005	6.25	
ADRIAMED_2004	ALA	5	PEC	TARTA	☑	07/11/2005	9.25	
ADRIAMED_2004	ALA	7	PEC	TARTA	☑	06/11/2005	14.25	
ADRIAMED_2004	ALA	8	PEC	TARTA	☑	07/11/2005	8.05	
ADRIAMED_2004	ALA	10	PEC	TARTA	☑	07/11/2005	14.00	
ADRIAMED_2004	ALA	12	PEC	TARTA	☑	07/11/2005	12.40	
ADRIAMED_2004	ALA	14	PEC	TARTA	☑	08/11/2005	16.40	

When invalid hauls are listed the system will ask to verify the data before the completion of the import procedure.



PLEASE VERIFY THE INFORMATIONS LISTED BELOW BEFORE IMPORTING DATA:

VALID.	SURVEY	UNIT	HAUL	SPECIES	TOT. W.	TOT. N.	NUM	WEIGHT	ADD NUM
N	ADRIAMED_2001	HRV	8	ELEDMOS	9.44	41	0	0	[illegible]
N	ADRIAMED_2001	HRV	22	ELEDMOS	1.5	16	0	0	[illegible]
Y	ADRIAMED_2001	ALB	3	PAGEERY	3.2	164	0	0	[illegible]
Y	ADRIAMED_2001	ALB	3	PAPELON	1.32	188	0	0	[illegible]
Y	ADRIAMED_2001	ALB	5	ELEDMOS	0.5	2	0	0	[illegible]
Y	ADRIAMED_2001	ALB	5	PAGEERY	8	140	0	0	[illegible]

5.5 Export

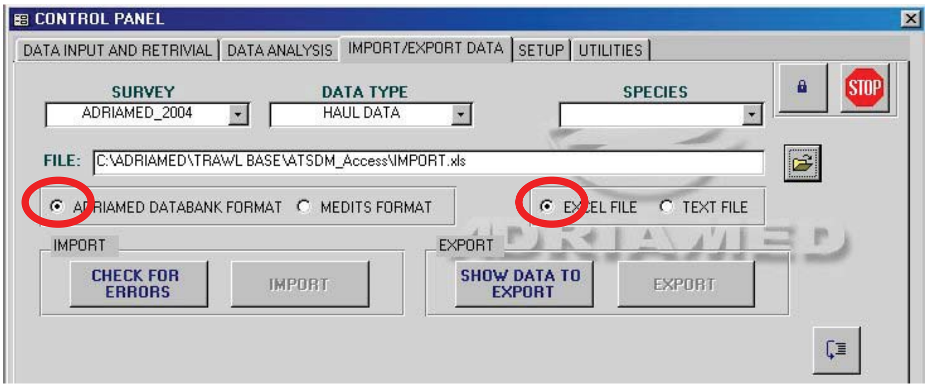
The procedure for exporting ATrIS records to another system is similar to that described in the para 5.1 Import.

1. *Choose the Survey*
   Using the scroll bar select the survey corresponding to the data to be exported (field SURVEY)

2. *Choose the type of data you want to export*
   Using the scroll bar indicate in the field DATA TYPE if the data to be exported are haul, catch or biological data (see para 5.2 and 5.3).

3. *Choose the species you want to limit the export procedure (if applicable)*
   Using the scroll bar indicate one species in the field SPECIES to limit the data to export to that species

4. *Select the format type*
   Click on the check for AdriaMed Databank format or MEDITS format. Both the Import/Export button procedures will be activated.

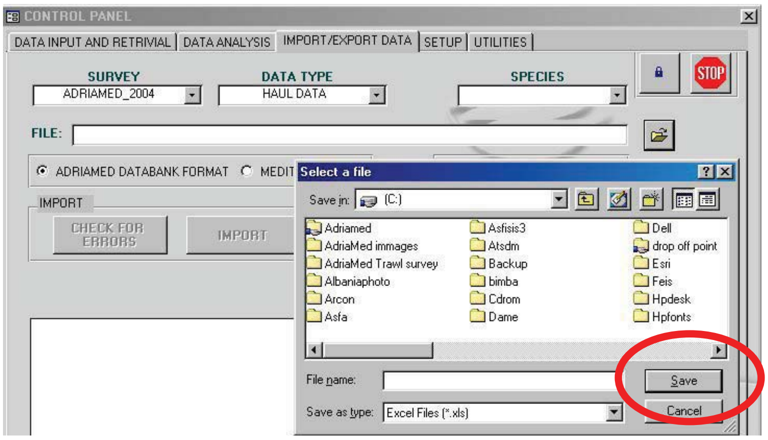


5. *Indicate the file name.*
   It is possible to create a new file or use an existing one.

   <u>Please note that when exporting data to an existing file, it will overwrite the file contents.</u>

   The new file can be created directly:
   a) indicate the directory in which the new file should be created,
   b) give a new name to the file and then
   c) click on SAVE.

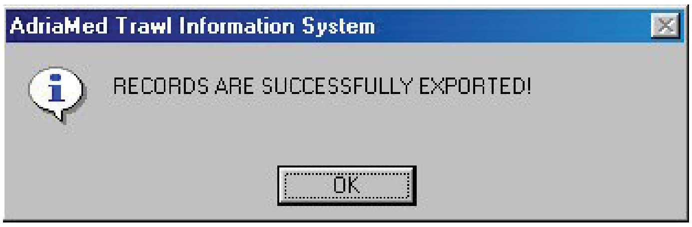
   The new file will be automatically generated. The new file will be shown in the FILE field of ATrIS.



6. *Click on SHOW DATA TO EXPORT.* The system will start to check the data for errors.

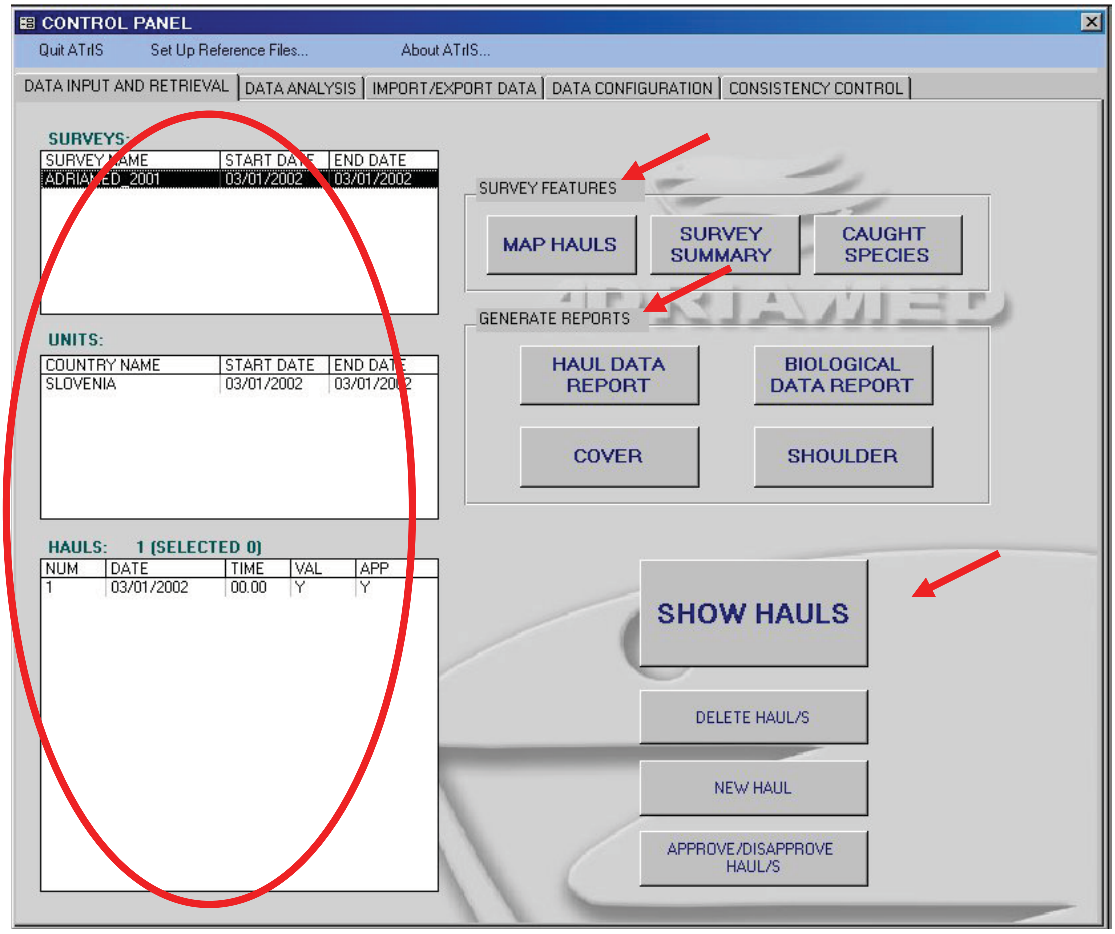
Please note that the MEDITS format are exported using the same column names used by MEDITS protocol (in French). Some fields (like the diameter funes=diameter warp) are missing because they are not included in the ATrIS database.

7. *Export records by clicking on EXPORT button.*
All the records will be finally exported and automatically they will be not displayed in the windows below; the button EXPORT will be disabled. A message box will alert you to the successful export.



6. Data Input and Retrieval

The Data Input and Retrieval panel is opened by default each time the application is accessed.



It visualizes the data included in the database (on the left hand side of the mask) and contains some useful features:

-Survey features

-Generate report

-Visualize data (hauls).

This section is also the starting point for a new data entry (see para 6.3).

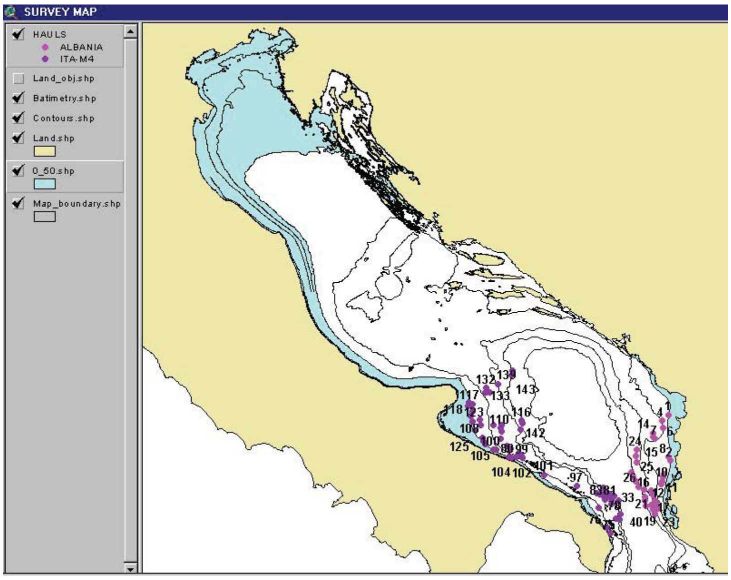
6.1 Survey features

This section contains three options: the possibility to map the hauls in the survey selected, the possibility to overview all data, hauls by hauls and the possibility to generate the list of all the species caught.



6.1.1. Map Hauls

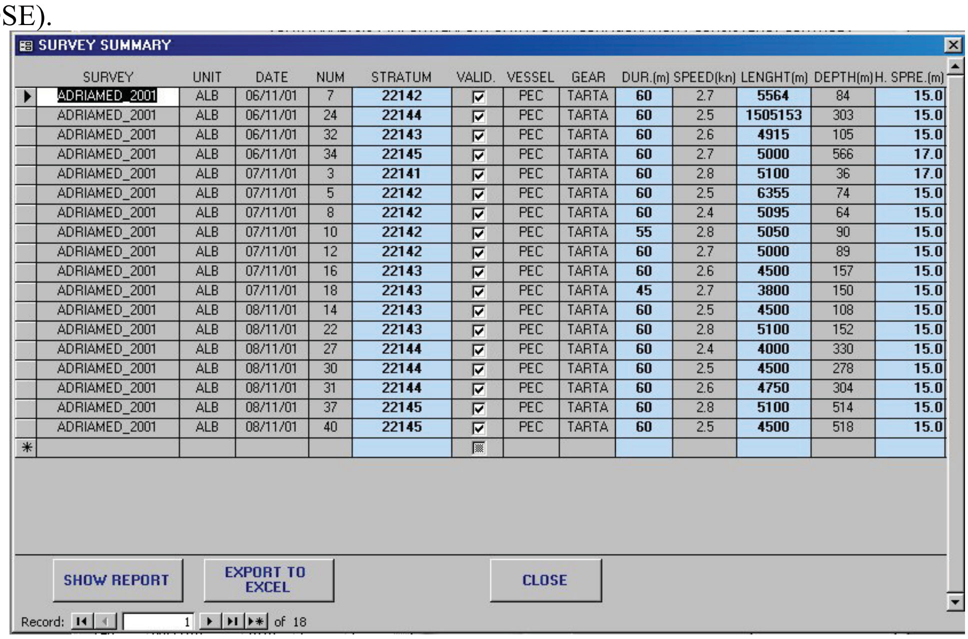
Click on the button MAP HAULS and all the hauls of the survey (or units) selected will be shown in a GIS Project. (see para 7.8 for the basic tools to view a map).



6.1.2 Survey Summary

Click on the button SURVEY SUMMARY. A table with all the data displayed by survey, units and hauls will be shown.

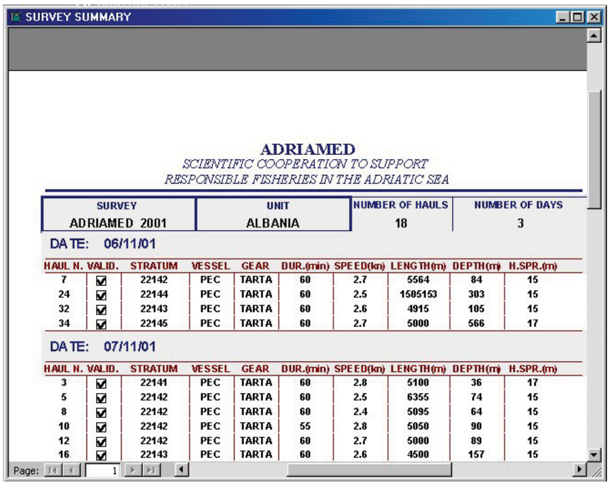
On the bottom of the table three buttons will allow the user to create a report (SHOW REPORT), to export to Excel the table (EXPORT To EXCEL) and to close the window (CLOSE).



SURVEY	UNIT	DATE	NUM	STRATUM	VALID.	VESSEL	GEAR	DUR.(m)	SPEED(kn)	LENGHT(m)	DEPTH(m)	H. SPRE.(m)
ADRIAMED_2001	ALB	06/11/01	7	22142	☑	PEC	TARTA	60	2.7	5564	84	15.0
ADRIAMED_2001	ALB	06/11/01	24	22144	☑	PEC	TARTA	60	2.5	1505153	303	15.0
ADRIAMED_2001	ALB	06/11/01	32	22143	☑	PEC	TARTA	60	2.6	4915	105	15.0
ADRIAMED_2001	ALB	06/11/01	34	22145	☑	PEC	TARTA	60	2.7	5000	566	17.0
ADRIAMED_2001	ALB	07/11/01	3	22141	☑	PEC	TARTA	60	2.8	5100	36	17.0
ADRIAMED_2001	ALB	07/11/01	5	22142	☑	PEC	TARTA	60	2.5	6355	74	15.0
ADRIAMED_2001	ALB	07/11/01	8	22142	☑	PEC	TARTA	60	2.4	5095	64	15.0
ADRIAMED_2001	ALB	07/11/01	10	22142	☑	PEC	TARTA	55	2.8	5050	90	15.0
ADRIAMED_2001	ALB	07/11/01	12	22142	☑	PEC	TARTA	60	2.7	5000	89	15.0
ADRIAMED_2001	ALB	07/11/01	16	22143	☑	PEC	TARTA	60	2.6	4500	157	15.0
ADRIAMED_2001	ALB	07/11/01	18	22143	☑	PEC	TARTA	45	2.7	3800	150	15.0
ADRIAMED_2001	ALB	08/11/01	14	22143	☑	PEC	TARTA	60	2.5	4500	108	15.0
ADRIAMED_2001	ALB	08/11/01	22	22143	☑	PEC	TARTA	60	2.8	5100	152	15.0
ADRIAMED_2001	ALB	08/11/01	27	22144	☑	PEC	TARTA	60	2.4	4000	330	15.0
ADRIAMED_2001	ALB	08/11/01	30	22144	☑	PEC	TARTA	60	2.5	4500	278	15.0
ADRIAMED_2001	ALB	08/11/01	31	22144	☑	PEC	TARTA	60	2.6	4750	304	15.0
ADRIAMED_2001	ALB	08/11/01	37	22145	☑	PEC	TARTA	60	2.8	5100	514	15.0
ADRIAMED_2001	ALB	08/11/01	40	22145	☑	PEC	TARTA	60	2.5	4500	518	15.0

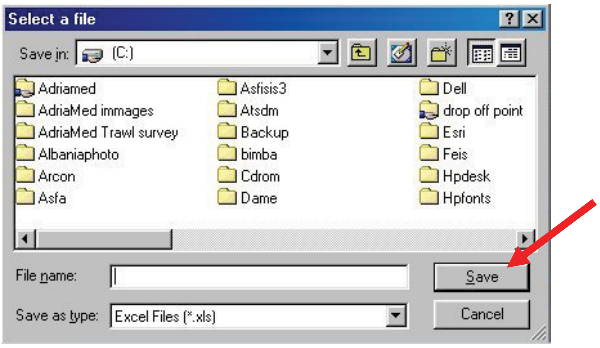
SHOW REPORT

To generate a report of the data chosen click on the button SHOW REPORT. A report will be created with a header summarizing the basic information on the survey and the list of all the haul data.



EXPORT TO EXCEL

To export data to Excel click on the EXPORT TO EXCEL button. A mask will be shown. Select a directory in which you want to save the file, choose a file name and click on the SAVE button. Please note that this is a save option, it is not necessary to use an existing Excel file but it is possible to create it when selecting the new file name in this mask.



Here is an example of data exported on Excel.

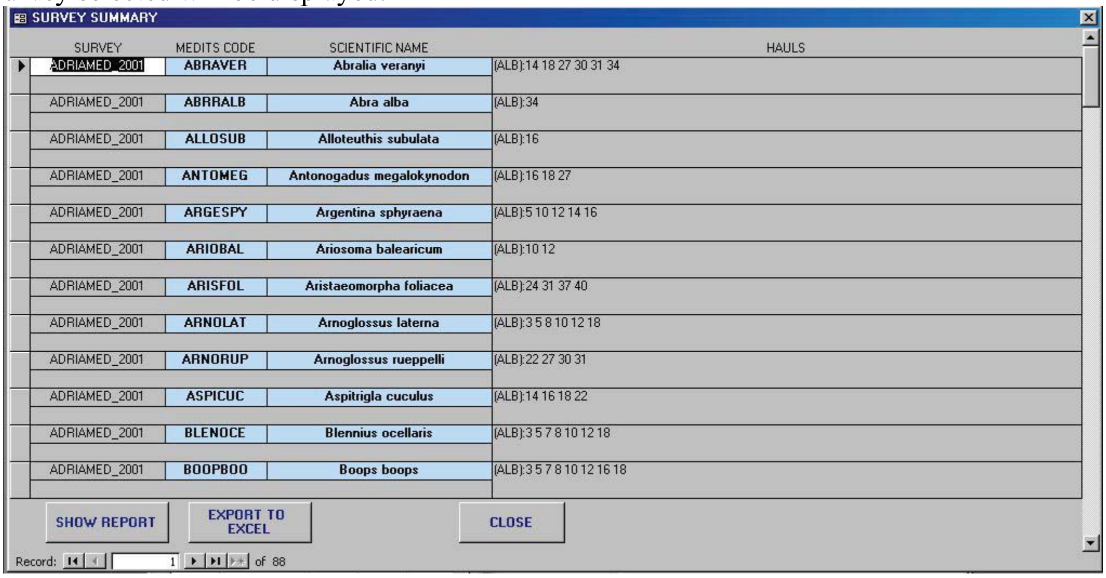
A1 = SURVEY

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SURVEY	UNIT	DATE	HAUL	STRATUM	AL	VESSEL	GEAR	DUR.(m	SPEED(kn	LENGTH(m	DEPTH(m	SPREAD(m)
2	ADRIAMED_2001	ALB	06-nov-01	7	22142		PEC	TARTA	60	2.7	5564	84	15.0
3	ADRIAMED_2001	ALB	06-nov-01	24	22144		PEC	TARTA	60	2.5	1505153	303	15.0
4	ADRIAMED_2001	ALB	06-nov-01	32	22143		PEC	TARTA	60	2.6	4915	105	15.0
5	ADRIAMED_2001	ALB	06-nov-01	34	22145		PEC	TARTA	60	2.7	5000	566	17.0
6	ADRIAMED_2001	ALB	07-nov-01	3	22141		PEC	TARTA	60	2.8	5100	36	17.0
7	ADRIAMED_2001	ALB	07-nov-01	5	22142		PEC	TARTA	60	2.5	6355	74	15.0
8	ADRIAMED_2001	ALB	07-nov-01	8	22142		PEC	TARTA	60	2.4	5095	64	15.0
9	ADRIAMED_2001	ALB	07-nov-01	10	22142		PEC	TARTA	55	2.8	5050	90	15.0
10	ADRIAMED_2001	ALB	07-nov-01	12	22142		PEC	TARTA	60	2.7	5000	89	15.0
11	ADRIAMED_2001	ALB	07-nov-01	16	22143		PEC	TARTA	60	2.6	4500	157	15.0
12	ADRIAMED_2001	ALB	07-nov-01	18	22143		PEC	TARTA	45	2.7	3800	150	15.0
13	ADRIAMED_2001	ALB	08-nov-01	14	22143		PEC	TARTA	60	2.5	4500	108	15.0
14	ADRIAMED_2001	ALB	08-nov-01	22	22143		PEC	TARTA	60	2.8	5100	152	15.0
15	ADRIAMED_2001	ALB	08-nov-01	27	22144		PEC	TARTA	60	2.4	4000	330	15.0
16	ADRIAMED_2001	ALB	08-nov-01	30	22144		PEC	TARTA	60	2.5	4500	278	15.0
17	ADRIAMED_2001	ALB	08-nov-01	31	22144		PEC	TARTA	60	2.6	4750	304	15.0
18	ADRIAMED_2001	ALB	08-nov-01	37	22145		PEC	TARTA	60	2.8	5100	514	15.0
19	ADRIAMED_2001	ALB	08-nov-01	40	22145		PEC	TARTA	60	2.5	4500	518	15.0

6.1.3 Caught Species

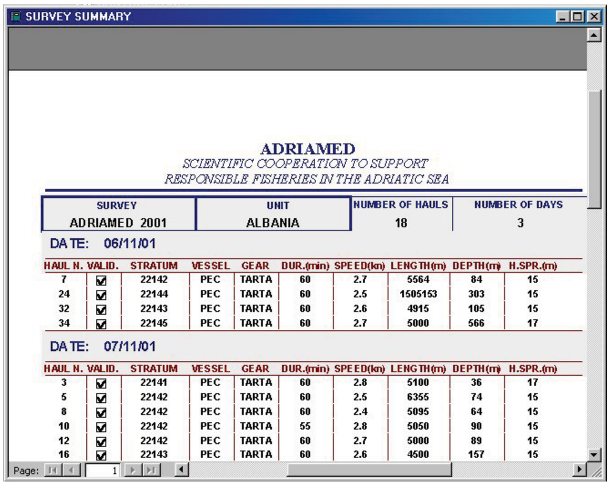


Click on the button CAUGHT SPECIES and the table of all the species captured during the survey selected will be displayed.



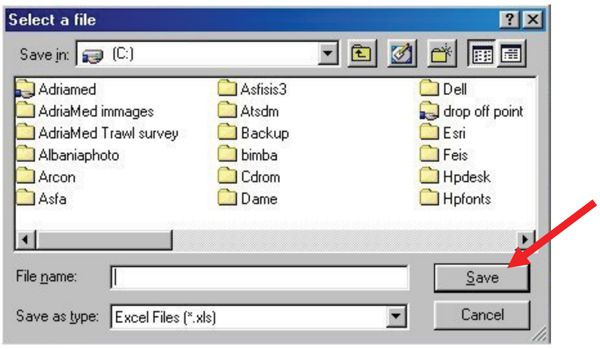
SHOW REPORT

To generate a report of the data chosen click on the button SHOW REPORT. A report with a header summarizing the basic information on the survey and the list of all the species will be created.



EXPORT TO EXCEL

To export data to Excel click on the EXPORT TO EXCEL button. A mask will be shown. Select a directory in which you want to save the file, choose a file name and click on the SAVE button. Please note that this is a save option, it is not necessary to use an existing Excel file but it is possible to create it when selecting the new file name in this mask.



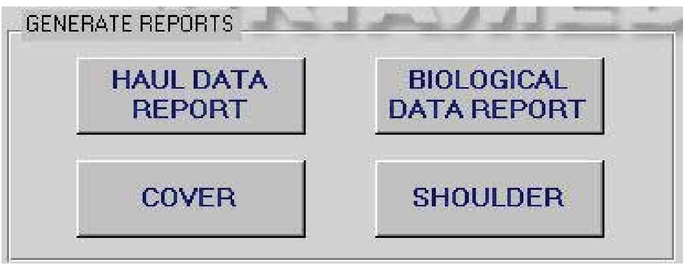
Here is an example of data exported on Excel.

A1 = SURVEY

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	SURVEY	UNIT	DATE	HAUL	STRATUM	AL	VESSEL	GEAR	DUR.(m	SPEED(kn	LENGTH(m	DEPTH(m	SPREAD(m)
2	ADRIAMED_2001	ALB	06-nov-01	7	22142		PEC	TARTA	60	2.7	5564	84	15.0
3	ADRIAMED_2001	ALB	06-nov-01	24	22144		PEC	TARTA	60	2.5	1505153	303	15.0
4	ADRIAMED_2001	ALB	06-nov-01	32	22143		PEC	TARTA	60	2.6	4915	105	15.0
5	ADRIAMED_2001	ALB	06-nov-01	34	22145		PEC	TARTA	60	2.7	5000	566	17.0
6	ADRIAMED_2001	ALB	07-nov-01	3	22141		PEC	TARTA	60	2.8	5100	36	17.0
7	ADRIAMED_2001	ALB	07-nov-01	5	22142		PEC	TARTA	60	2.5	6355	74	15.0
8	ADRIAMED_2001	ALB	07-nov-01	8	22142		PEC	TARTA	60	2.4	5095	64	15.0
9	ADRIAMED_2001	ALB	07-nov-01	10	22142		PEC	TARTA	55	2.8	5050	90	15.0
10	ADRIAMED_2001	ALB	07-nov-01	12	22142		PEC	TARTA	60	2.7	5000	89	15.0
11	ADRIAMED_2001	ALB	07-nov-01	16	22143		PEC	TARTA	60	2.6	4500	157	15.0
12	ADRIAMED_2001	ALB	07-nov-01	18	22143		PEC	TARTA	45	2.7	3800	150	15.0
13	ADRIAMED_2001	ALB	08-nov-01	14	22143		PEC	TARTA	60	2.5	4500	108	15.0
14	ADRIAMED_2001	ALB	08-nov-01	22	22143		PEC	TARTA	60	2.8	5100	152	15.0
15	ADRIAMED_2001	ALB	08-nov-01	27	22144		PEC	TARTA	60	2.4	4000	330	15.0
16	ADRIAMED_2001	ALB	08-nov-01	30	22144		PEC	TARTA	60	2.5	4500	278	15.0
17	ADRIAMED_2001	ALB	08-nov-01	31	22144		PEC	TARTA	60	2.6	4750	304	15.0
18	ADRIAMED_2001	ALB	08-nov-01	37	22145		PEC	TARTA	60	2.8	5100	514	15.0
19	ADRIAMED_2001	ALB	08-nov-01	40	22145		PEC	TARTA	60	2.5	4500	518	15.0

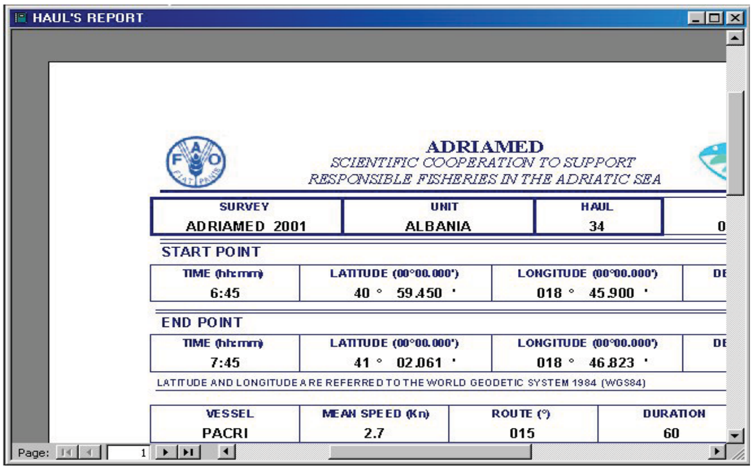
6.2 Generate Reports

ATrIS has modules to generate reports. When a table is generated the possibility to create a report is represented generally by a button SHOW REPORT which will automatically create a report of the data selected. In the DATA INPUT AND RETRIEVAL there is a complete section dedicated to the report generation. The option in this panel is particular powerful as it allows the user to create a report summarizing all the data recorded during a survey. It could be useful to create a report annually to archive all the data of a certain survey or to create a report for administrative (ministerial) purposes. The following paragraphs illustrate the steps to generate a report.



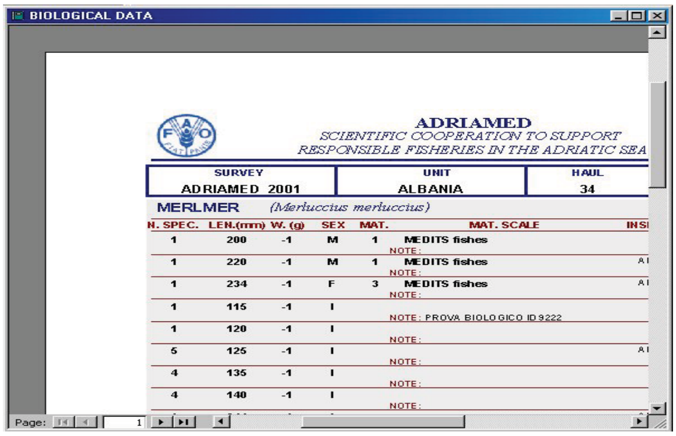
6.2.1 Haul Map Report

Click on this button and a report will be generated on all the haul recorded for the survey selected. The haul data are reported (start point and end point, gear, vessel, etc) and the list of the catches for that haul. The information on the person who performed the data entry or any modifications are shown in the report but they can be omitted (as illustrated in Chapter 4, para 4.16.2).



6.2.2 Biological Data Report

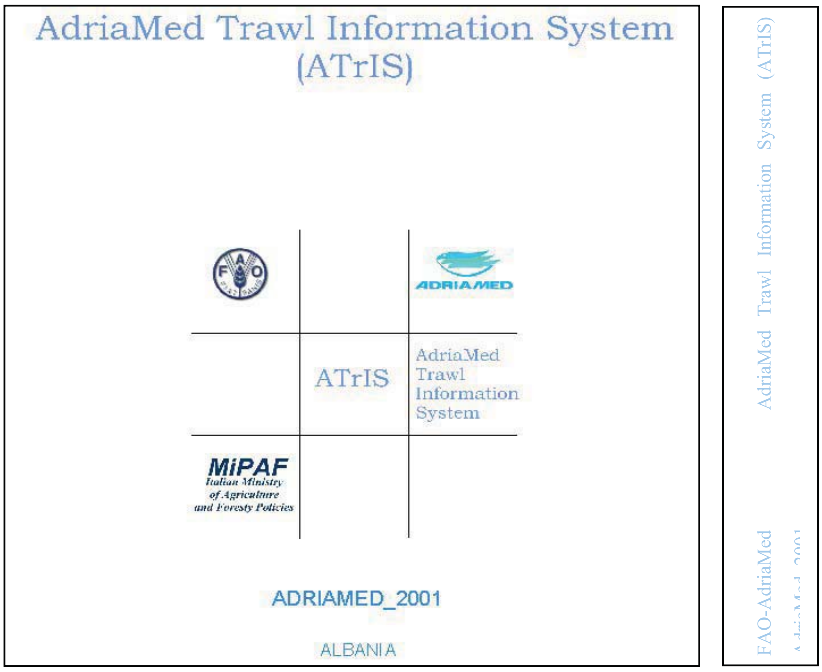
In the same manner the report of all the biological data inserted for each haul of the selected survey can be generated. The report will show haul by haul, species by species (only the target species), all the biological data (length, weight, sex, maturity, maturity scale). As in the hauls data the information on the person who performed the data entry or any modifications are shown in the report but they can be omitted (as illustrated in Chapter 4, para 4.16.2).



6.2.3 Cover/Shoulder

ATrIS provide this useful tool to complete the creation of a report. By clicking the COVER and SHOULDER buttons a cover and its corresponding shoulder for the report will be generated. The cover will show the ATrIS logo, the name of the survey selected and the

eventually selected unit. The shoulder will report the ATrIS acronym and the full name and the name of the survey selected.



6.3 Visualize data

On the left hand side the mask SURVEY displays (if any) the surveys already in the database: automatically, by clicking on a survey the list of the Units reported for that survey will be displayed in the mask below (the UNIT mask).

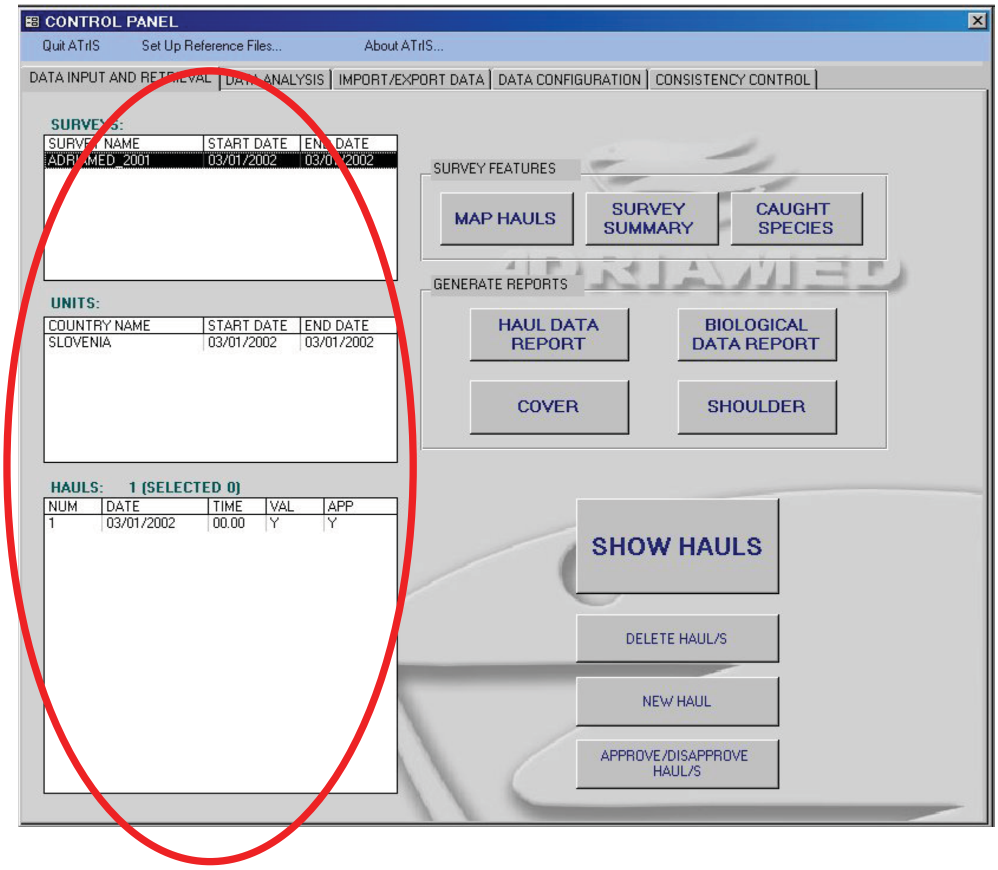


Figure 6.1. The Data Input and Retrieval section.

Both the masks SURVEYS and UNITS display the data with a start and end date. To visualize the stations for each unit click on the HAULS mask: the list of all the hauls carried out will be shown. The mask HAULS automatically gives the number of hauls contained and, if selected, the number of the selected.

The mask HAULS shows information on the date and time of each station and two more values: VAL (Validity) and APP (approved) with a Yes or No (Y/N) code.

VAL (Validity)

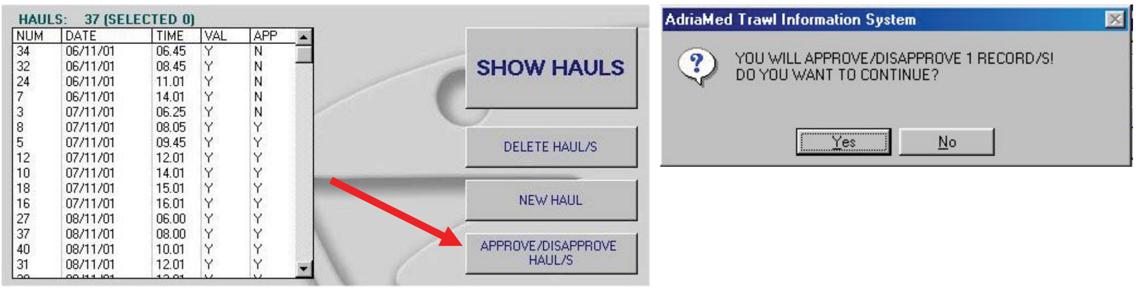
This field shows if the haul carried out is valid or not (i.e. the haul was carried out during the night and it is stored just for the archive but cannot be considered valid).

APP (Approval)

This field shows the approval status of the data. Each time new data are inserted in the database the Administrator should verify and approve the new data (see para 6.3.1).

6.3.1 Approve/disapprove a record

To disapprove/approve a record, the button on the right side of the mask can be used. A message box will inform on the number of records to be approved/disapproved and the table will then display the changes.
The Approval/Disapproval operation is only permitted to the ADMINISTRATOR account (see Chapter 4, para 4.16.1).



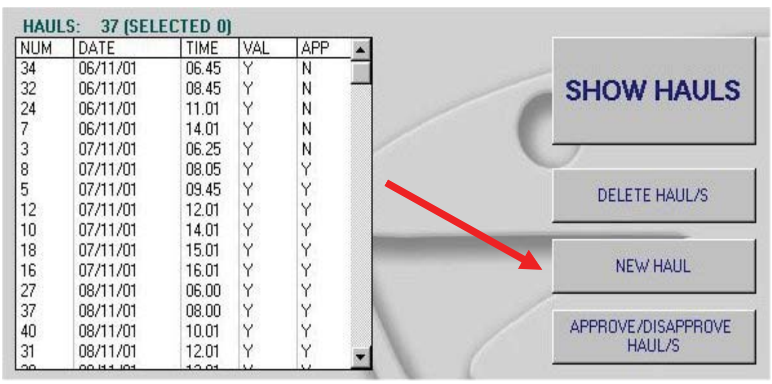
6.3.2 Delete a record

To delete a haul or a selection of hauls, select with CTRL+ the hauls to be deleted and press the button indicated below. Two message boxes will appear. To delete the records press Yes in both messages.



6.3.3 Add a new haul

To create a new record (haul) press the button indicated below and a new blank mask will appear. For more details see Chapter 6, para. 6.4.3.

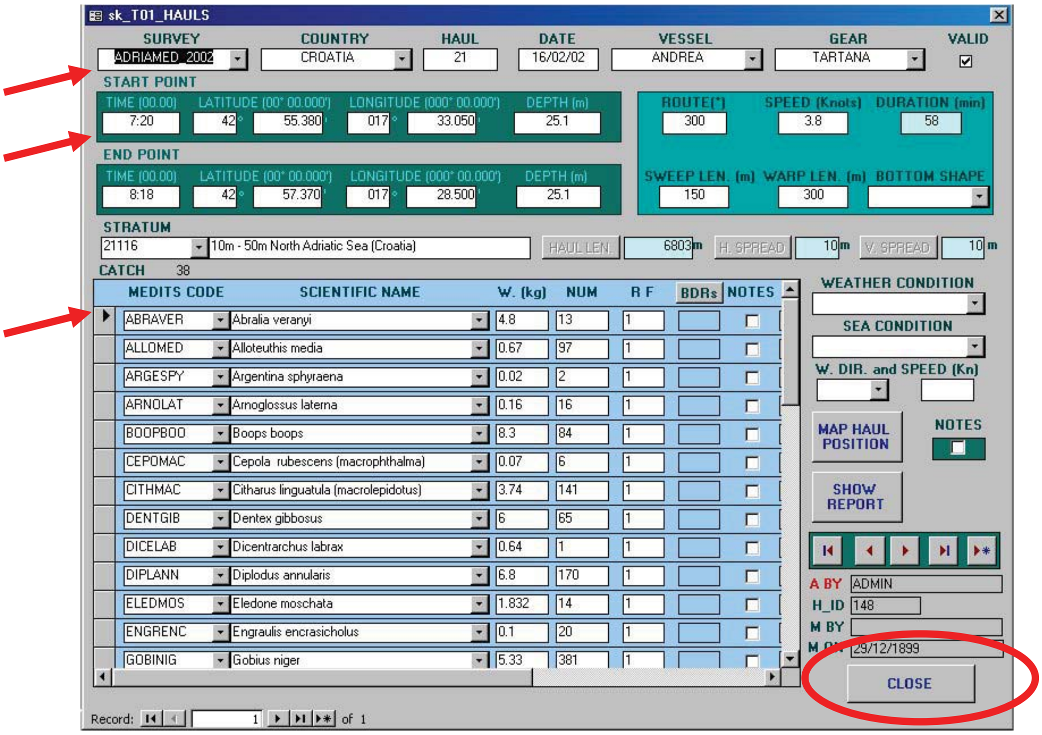


6.3.4 Show hauls

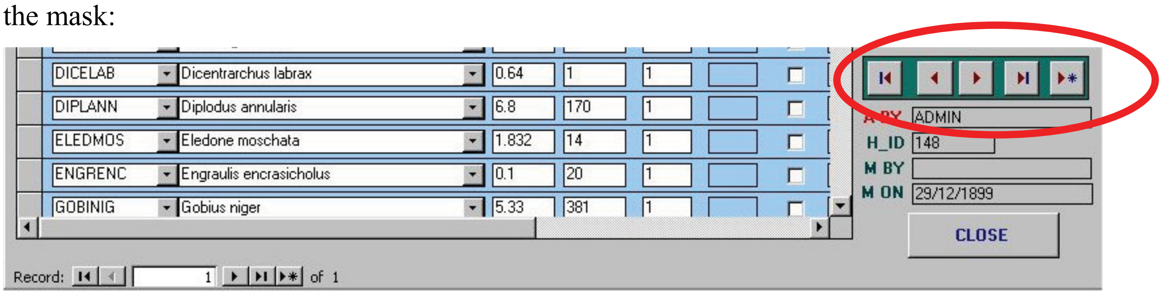
To visualize the data for the haul/hauls selected click on the button "SHOW HAULS".

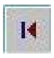


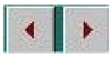
A mask will appear with all the data. The mask contains information on:
Survey,
Hauls,
Stratum,
Meteorological data,
Biological data.

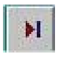


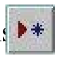
To visualize all the hauls recorded in the survey use the buttons on the bottom right side of the mask:



The button  shows the first record.

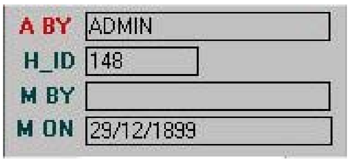
The buttons  allow the user to scroll the hauls

The button  visualizes the last record.

The button  allows the user to add a new record (see the section on the new data entry, para 6.2.3).

To close the sheet and come back to the list of hauls press the button CLOSE. 

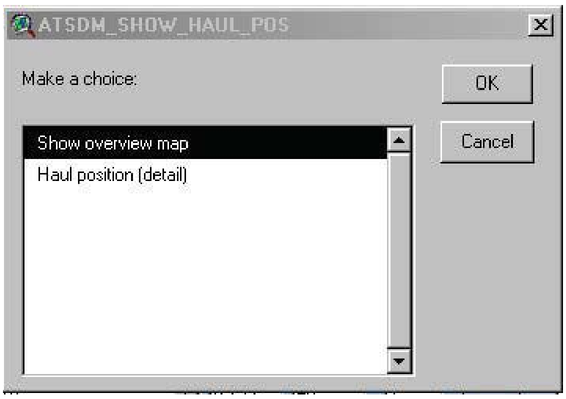
The mask also visualizes information on the status of the record:



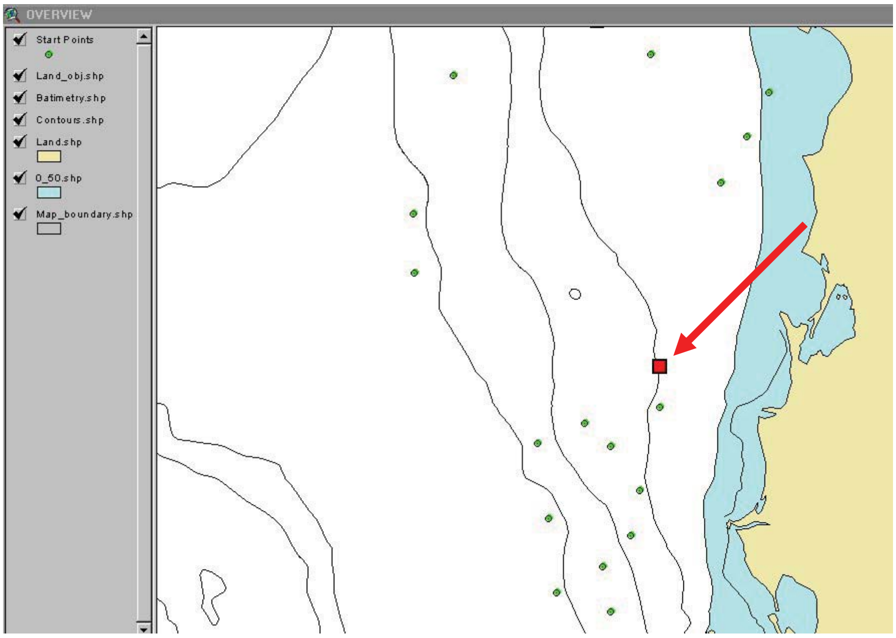
A BY: Who approved the haul,
H_ID: haul ID
M BY: who made modifications,
M ON: the date of the last modification
(see also para 6.3.1 for the haul validation and/or modification).

6.3.4.1 Map Haul Position

To visualize the haul position on a map click on the button MAP HAUL POSITION. ArcView will be opened and a window will be displayed with two options.

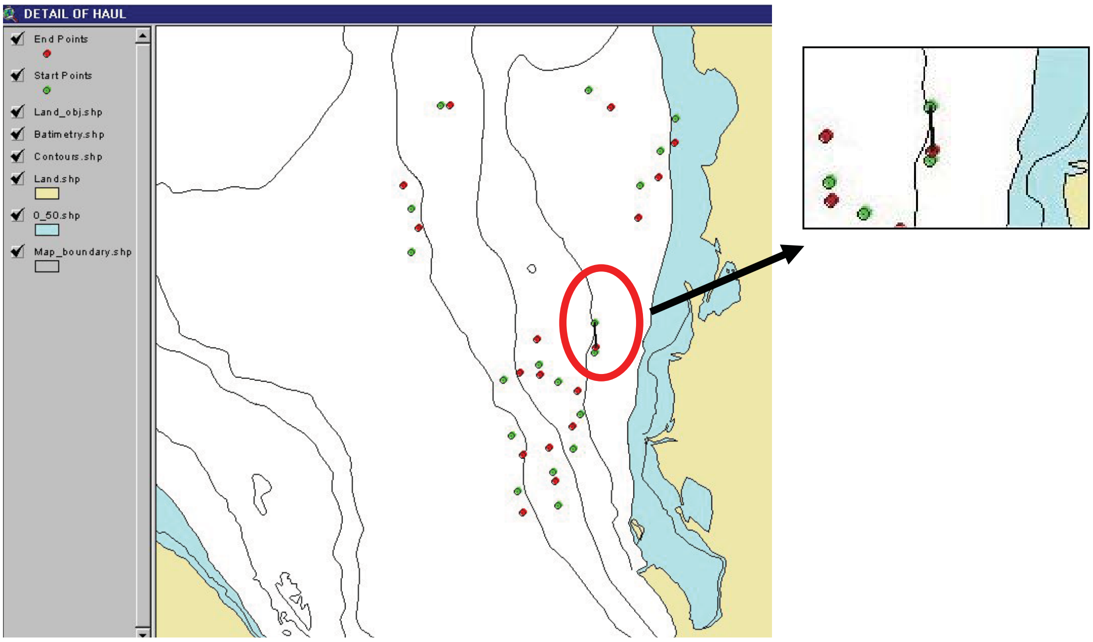


SHOW OVERVIEW MAP
Show overview map will show the position of the selected haul in the complete map with a red square.



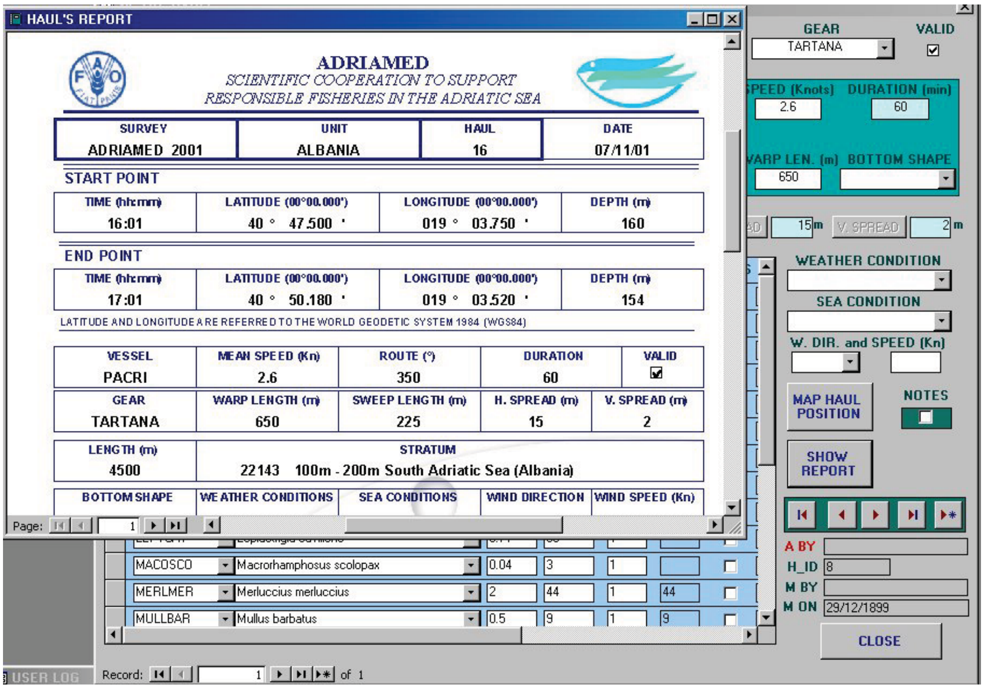
HAUL POSITION (details)

Haul Position (details) will show, by zooming, the exact position of the start point and the end point of the haul selected.



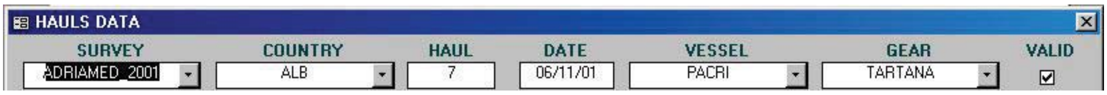
SHOW REPORT

To generate a report click on the button SHOW REPORT. A report will be created for the selection.



6.3.4.2 Survey

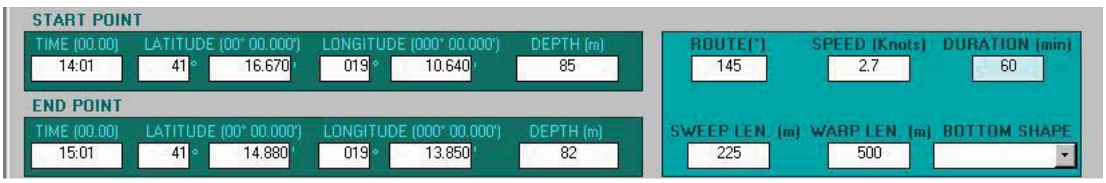
This part of the mask visualizes data on the survey. It contains the following fields (see also Chapter 3):



SURVEY: the name of the survey
COUNTRY: the name of the country/unit
HAUL: the code of the station in that survey
DATE: the date in which the haul was carried out
VESSEL: the code of the vessel
GEAR: the gear used in that survey
VALID: a check to verify if the haul has been considered valid or not

6.3.4.3 Hauls

This part of the mask contains technical information on the haul.



A two line series of boxes gives information on the time, LATITUDE, LONGITUDE and DEPTH for both the starting point and the end point of the haul.
On the right hand side of the mask a green box visualizes data on the ROUTE (degrees), speed (Knots), DURATION of the haul (min), SWEEP LENGTH (m) and WARP LENGTH (m) of the gear used, and the BOTTOM SHAPE of that station.

6.3.4.4 Stratum

This line of the mask contains data on the stratum in which the haul was carried out. A two-field box includes the STRATUM code and the description of it. These fields are read-only and they can not be changed when the haul is validated.



Three boxes on the right contain information on HAUL LENGTH, and two technical information of the gear used: the HORIZONTAL SPREAD and the VERTICAL SPREAD of the gear.

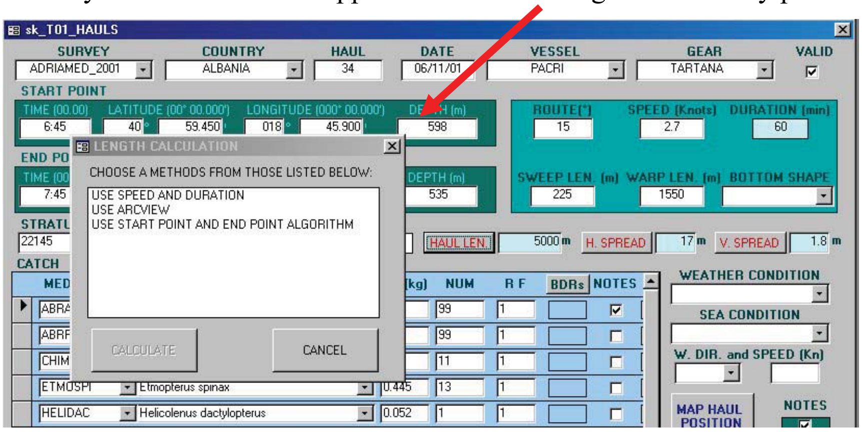
HAUL LENGTH/HORIZONTAL SPREAD/VERTICAL SPREAD

ATrIS will automatically calculate the vertical and horizontal spread of the gear, if not available, by clicking on the buttons using the following algorithm:

Gear	AdriaMed (GRUND)	MEDITS
Horizontal spread	13.13+0.00474*L	$17.45613(1-e^{-0.33243\,((L/100)+3.60468)})$
Vertical spread	0.731-0.000067*L	$5.351(L^{-0.086})$

*L=warp length

HAUL LENGTH
Three different methods are available to estimate the HAUL LENGTH:
-Start point and end point algorithm
-Speed and duration
-Use ArcView
Click on HAUL LENGTH button to visualize the message box. Note that by clicking twice in the field HAUL LENGTH, it is possible to enter in the field and change/delete the contents of it (this is valid only if the haul is a not approved haul or during the data entry procedures).



-Start point and end point algorithm

The HAUL LENGTH is estimated in units of nautical miles (nm) by (Sparre and Venema, 1998):

$$D = 60 * \sqrt{(Lat1 - Lat2)^2 + (Lon1 - Lon2)^2 * \cos^2(0.5 * (Lat1 + Lat2))}$$

where

Lat1 = latitude at start of haul (degrees)
Lat2 = latitude at end of haul (degrees)
Lon1 = longitude at start of haul (degrees)
Lon2 = longitude at end of haul (degrees)

-Speed and duration

If exact positions are not available, but only the velocity of the vessel and the duration of the haul, then the distance covered per hour can be calculated from:

$$D = V*t$$

where

V = velocity of vessel (knots = nm/hr)
t = duration of the haul (min)

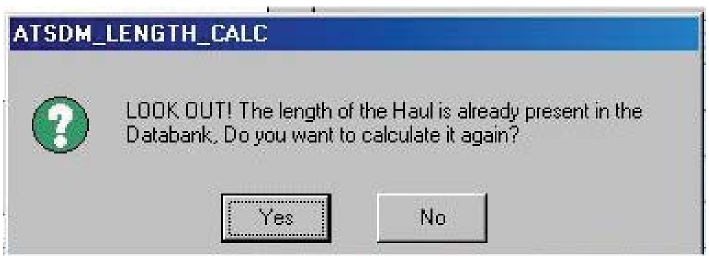
-Use ArcView

Another method to estimate the distance covered during the haul is to use the Projected coordinate system of ArcView.

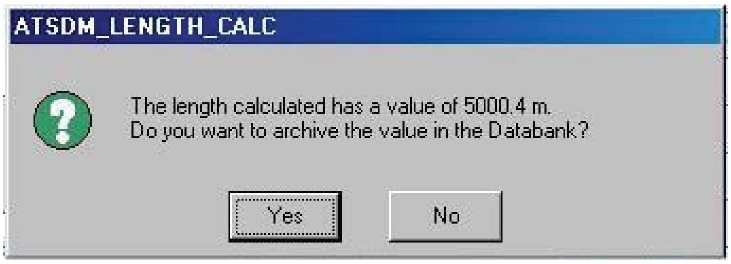
The system will project the start point and the end point in a X-Y plane. In a projected coordinate system, locations are identified by x, y coordinates on a grid, with the origin at the center of the grid. Each position has two values referencing it to that central location. One specifies its horizontal position and the other, its vertical position. The two values are called the x coordinate and y coordinate. In this case the x and y coordinates will be the start and end point.

The system will then calculate the Euclid's distance between the two points which will correspond to the length of the haul.

If the haul length is already calculated and the user wishes to estimate, using another method, the following message will appear. Click Yes to calculate again the value or click No to leave the old value.



When the new value is calculated a message will ask to archive it.

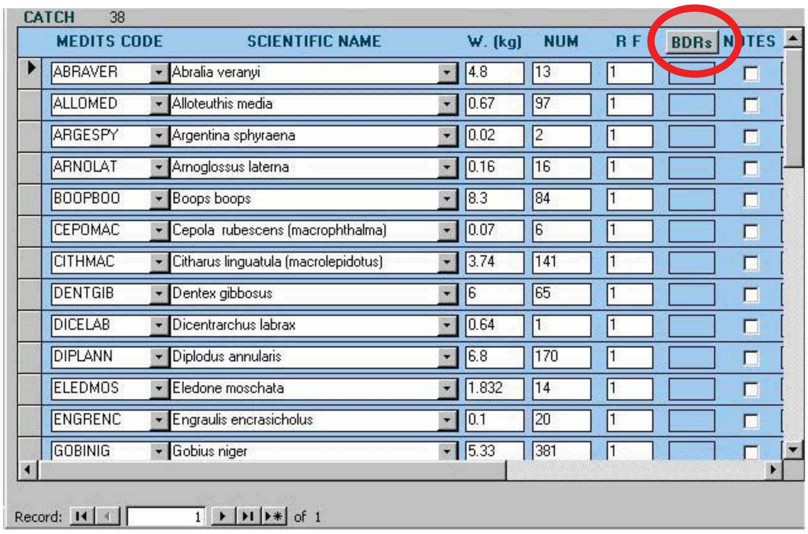


6.3.4.5 Meteorological data

On the right side of the mask four fields represent the meteorological information collected during the survey:
Weather condition
Sea condition
Wind direction
Wind speed (Kn)

6.3.4.6 Biological data

This section of the mask summarizes the biological data of all the species caught during the survey. The fields appear in the following order:
MEDITS Code: the MEDITS code used to identify the species
Scientific name: the scientific name of the species
W (kg): the total weight of the species caught during that haul
Num: the total number of specimens caught
RF: the conditional factor used (if available) for the catch
BDRs: a filter to select only the target species (see below)
Notes: shows the notes, if any.



Then, in grey, three fields summarizing the status of the record:

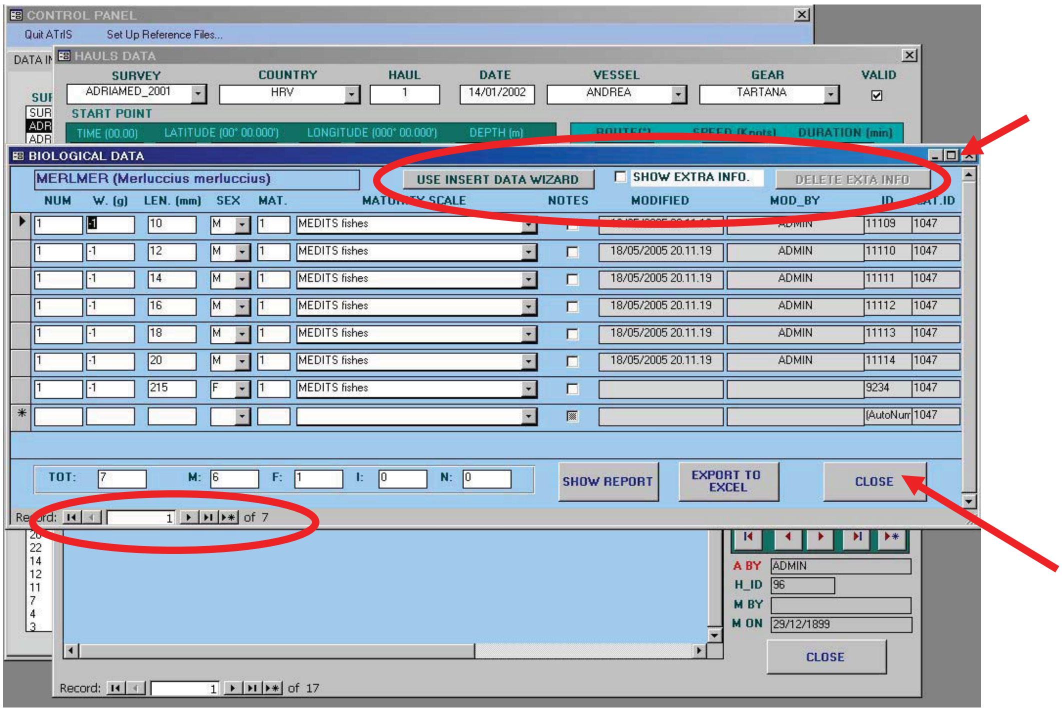
Modified: the date and time of the modification
MOD by: the name of the last person who modified the record
Catch ID: the ID that the system automatically assigns to each catch record.

To filter data by <u>target species</u> click on the button 

. The list will be limited to the target species. To go back to the list of all species, click again on the button BDRs.

Another way to visualize the target species is to double click on the field BDRs.

Double clicking on the field of each species an additional mask will be opened showing the single data for the selected species, for each specimen with data on the number, weight, length, sex and maturity scale associated. On the bottom of the mask the total number of specimens, total male, total female and total indiscriminate and total not classified are available.



If individual data are not available the string reports a –1 value indicating that for that specimen the weight is not available. (This occurs mainly when length measurements on board are taken by length class).

Three buttons on the top of the mask are displayed:

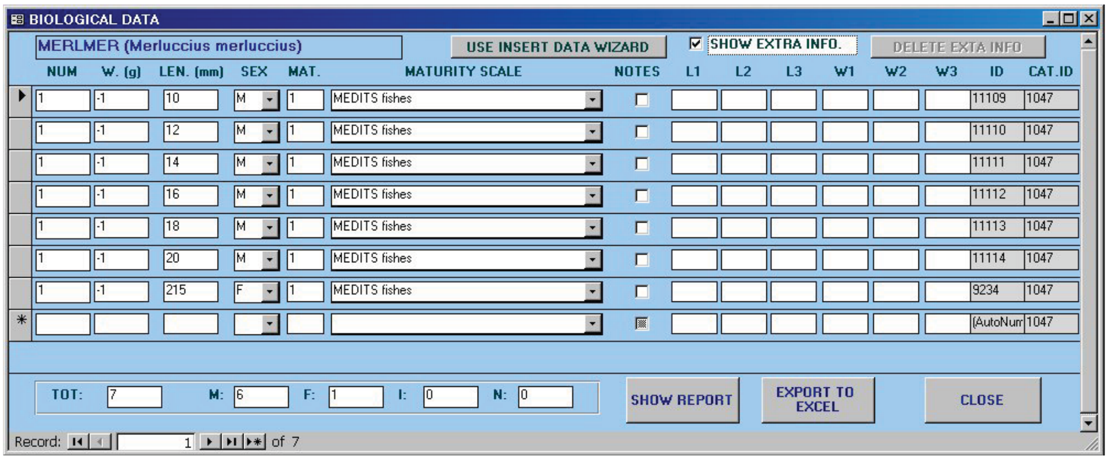


USE INSERT DATA WIZARD, SHOW EXTRA INFO, DELETE EXTRA INFO.

USE INSERT DATA WIZARD
This tools facilitate users during data entry allowing the user to make a multiple input with individuals with the same characteristics (for more details see para 6.4.3.1).

SHOW EXTRA INFO

The SHOW EXTRA INFO tool displays, if checked, additional information which can be available for a single individual (i.e. Standard Length (ST) or gonad weight).



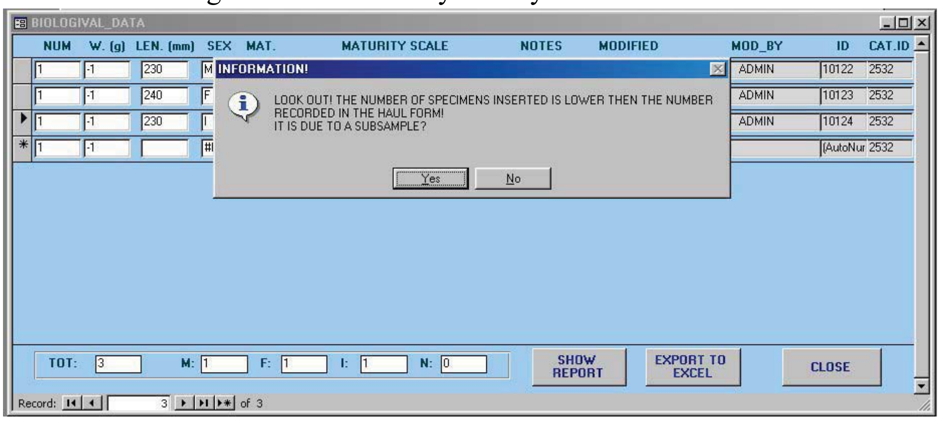
DELETE EXTRA INFO

This tool allows the user to delete additional information previously added.

To add a note double click on the mask, a pop up will be opened, Add the text and click on the button CLOSE. The text will be memorized and the record will show a check on the filed NOTES.

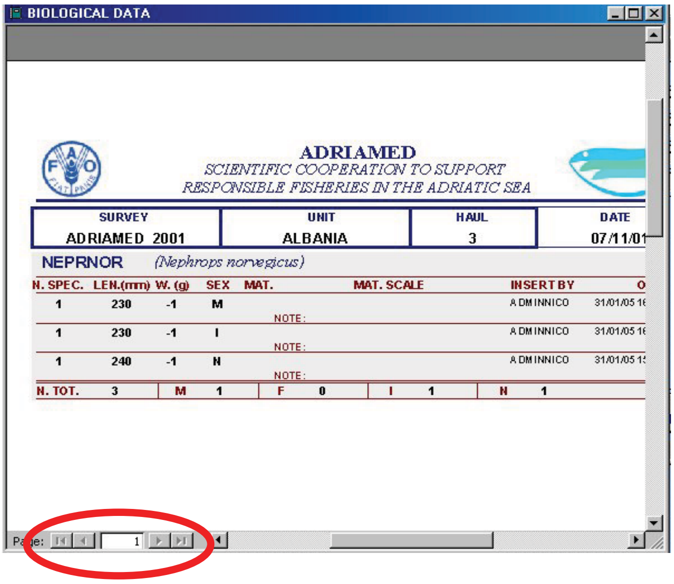
To scroll all the records use the buttons of the bottom of the mask. To close this window and go back to the biological data list click on the button CLOSE or use the symbol X on the top of the window.

When closing the window a warning message will appear if the number of record of biological data does not coincide with the number of specimens caught in the survey (i.e. 58 *Merluccius merluccius* caught in the haul 42, with biological data available just for 4 specimens). Click yes if it is really a problem of subsampling, click no if it is just an error in order to check the record again and if necessary modify it.



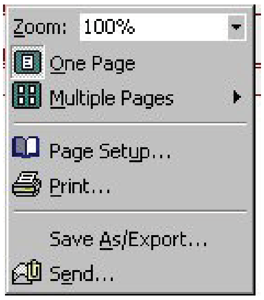
SHOW REPORT

To generate a report of the biological data chosen click on the button SHOW REPORT. A report will be created with a header summarizing the basic information on the survey, the name of the species and the list of all the biological data, specimen by specimen, with, also, information on the record.



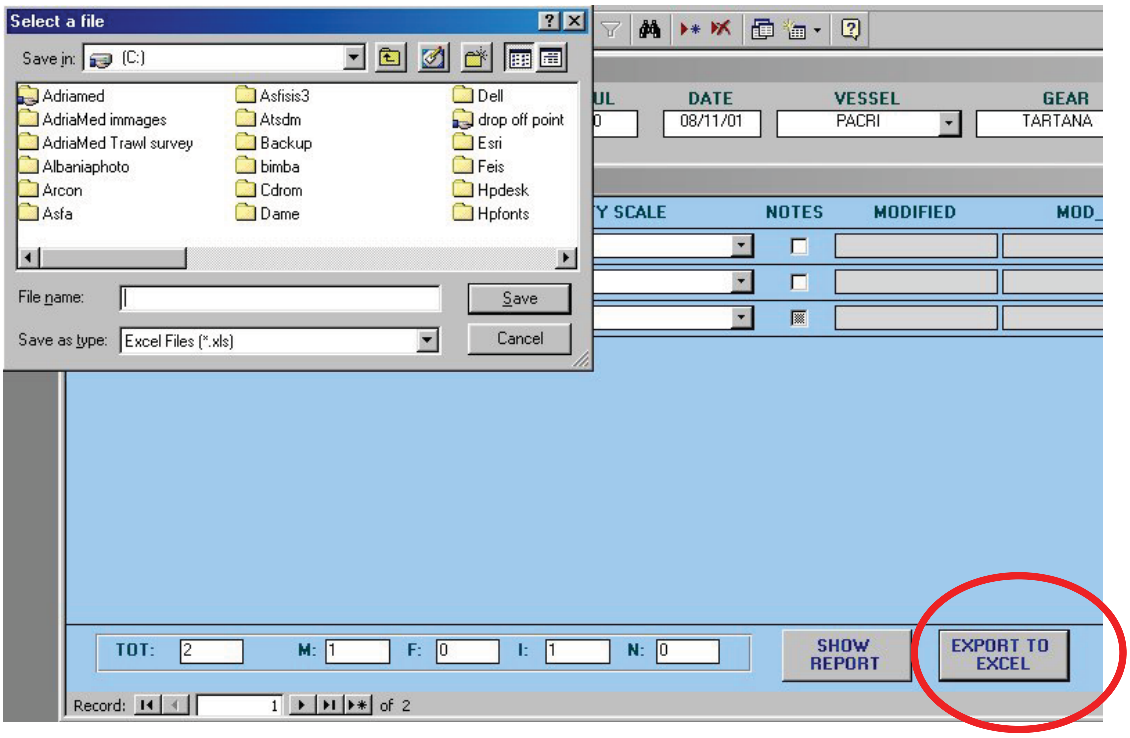
To visualize all the reports use the buttons on the bottom of the page.

To print the report/s click on the menu bar PRINT button , or on the menu FILE/PRINT or click with the right button of the mouse and select PRINT.



EXPORT TO EXCEL

To export filtered data on Excel click on the button EXPORT TO EXCEL. A window will be opened asking the name of the file.



Choose a file name and select the directory in which you want to put the file. Click on save and the data will be automatically exported on an EXCEL file.

R1C1 = F03_WEIGHT

	1	2	3	4	5	6	7	8	9	10	11
1	3_WEIG	03_NUM	F03_MODIFIED	F03_MOD_BY	F03_MAT_SCALE_ID2	3_LENG	03_SE	MATU	_CATCH	BIO_DA	F03_MAT_SCALE_ID
2	-1	1			MEDITS fishes	220	M	1	58	9105	MEDITS fishes
3	-1	1			MEDITS fishes	255	M	2	58	9106	MEDITS fishes
4	-1	1			MEDITS fishes	260	M	2	58	9107	MEDITS fishes
5	-1	1			MEDITS fishes	290	M	2	58	9108	MEDITS fishes
6	-1	1			MEDITS fishes	360	M	2	58	9109	MEDITS fishes
7	-1	1			MEDITS fishes	220	F	2	58	9110	MEDITS fishes
8	-1	1				100	I		58	9111	
9	-1	1				105	I		58	9112	
10	-1	8				110	I		58	9113	
11	-1	3				115	I		58	9114	
12	-1	7				120	I		58	9115	
13	-1	2				125	I		58	9116	
14	-1	5				130	I		58	9117	
15	-1	6				135	I		58	9118	
16	-1	4				140	I		58	9119	
17	-1	1				160	I		58	9120	
18											
19											
20											

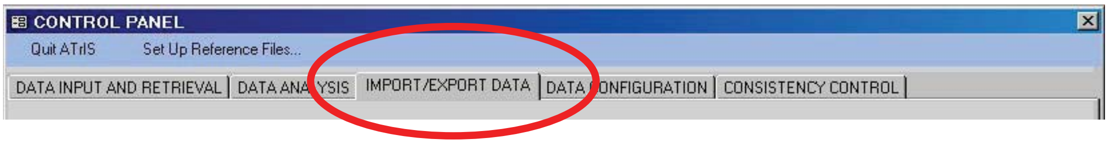
6.4 New data entry

When the set up is completed (see chapter 4) new records can be added to the database. The system provides three procedures to add new data:
1) Import/Export
2) Add New Record
3) Add New Record in a selected survey.

Please note that by clicking the button ESC (escape) once on the top left side of the keyboard the field you are updating will be cleared. Double click on ESC will automatically delete all the record (=all the fields).

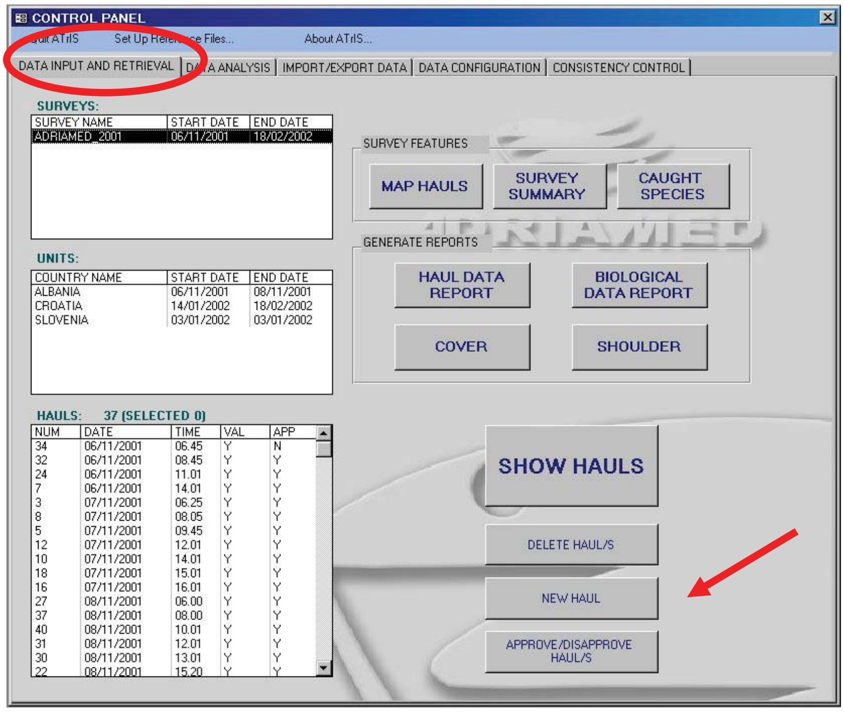
6.4.1 Import/Export

The Import procedure allows the user to add new data, already on another databank or software, on the ATrIS system. See chapter 5 for a complete description of the method.



6.4.2 Add New Record

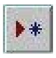
To add a new record click on the NEW HAUL in the section Data Analysis and Retrieval and a new blank mask will appear.



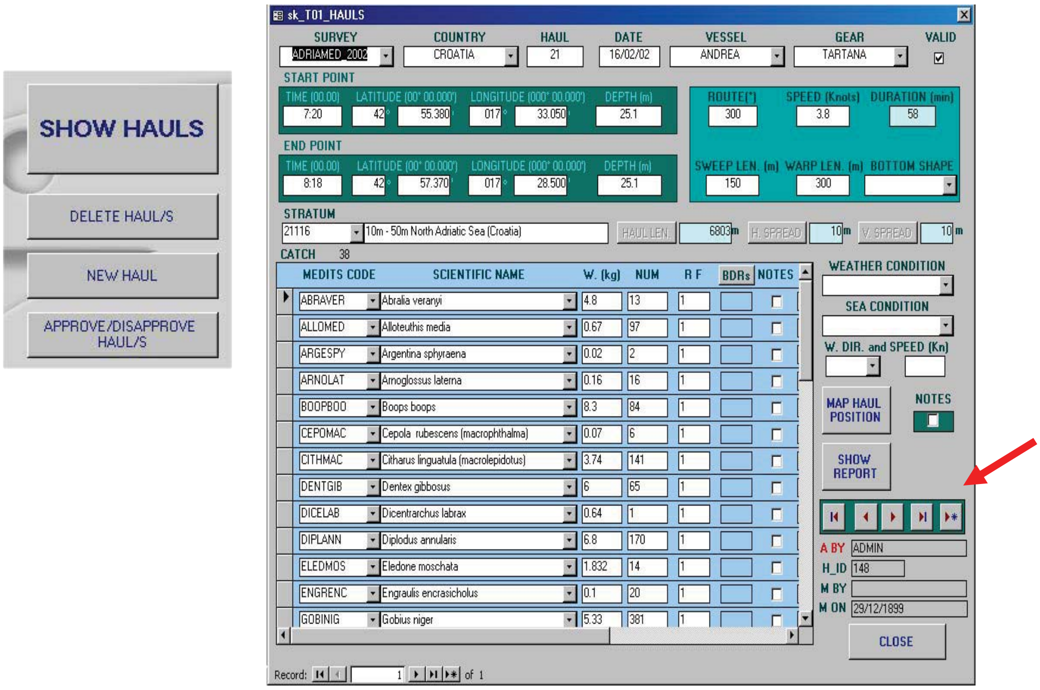
Start to insert all the values needed. The data validation system will detect any error or mistake and will inform the user. For each field the warning/error message boxes are displayed in Chapter 5.

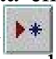
6.4.3 Add New Record in a selected survey

There are two ways to add a new record when a survey is already selected.

A)
If a survey and the relative unit and haul is selected it is possible to add a new record by clicking on the button  with the field already partially completed with the survey data (see para 6.2.2).

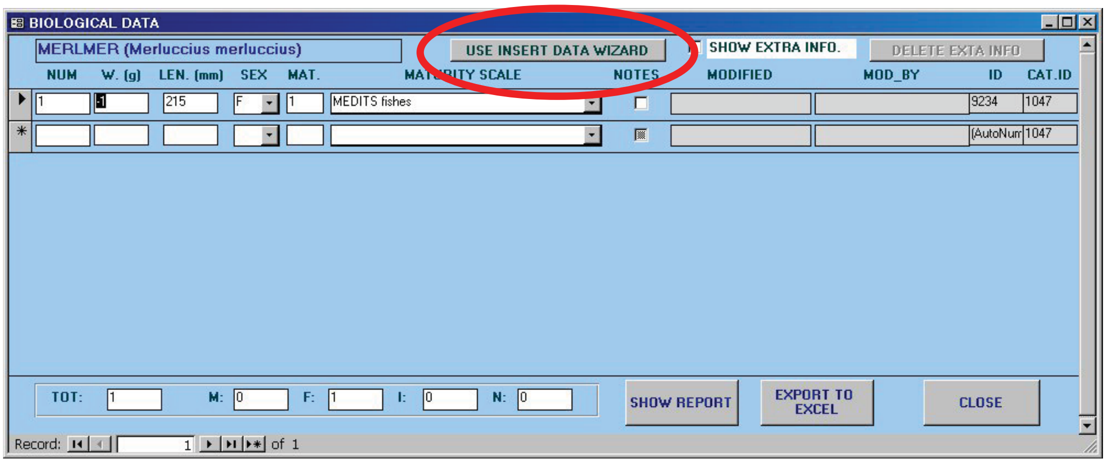
For example if the survey AdriaMed 2004 is selected with the haul 12 of Albania, the new record will have the data relative to AdriaMed 2004 already in the mask and a successive haul number, 13.



B)
In a similar way it is possible to insert a new record when the data entry is already started. When the haul mask of a new haul is completed click on the button  and a new mask with the same survey data will be opened. (see on the left side of the figure above).

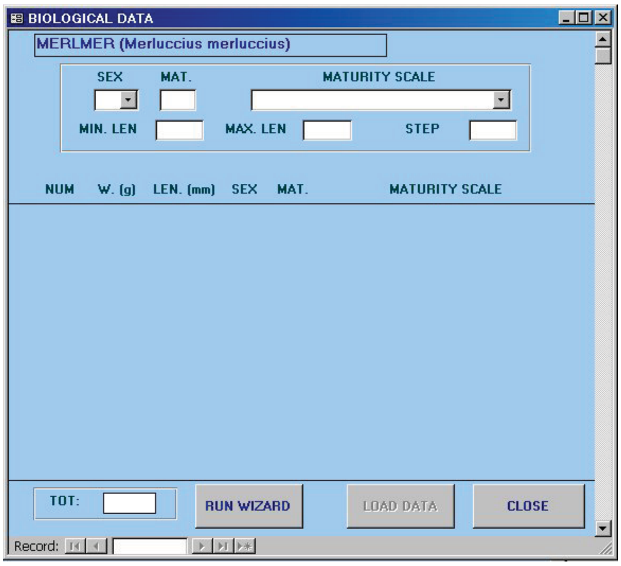
6.4.3.1 Add biological data to a new record

To add biological data in a new record double click on the scientific name of the selected species. The following mask will be displayed. Fill all the fields and be helped by the options for sex and maturity scale available. A specific tool is the INSERT DATA WIZARD.



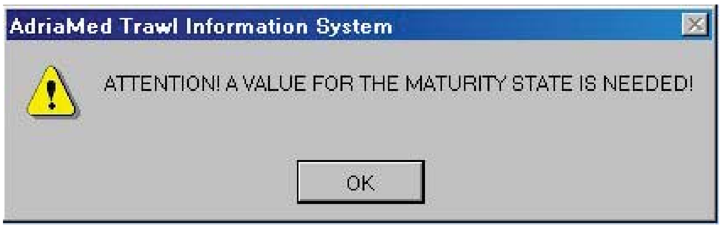
USE INSERT DATA WIZARD

When click on the USE INSERT DATA WIZARD button the following mask will be displayed. This tool allow the user to insert biological data for a group of individuals having the same biological characteristics.



Choose the SEX and then the maturity stage (MAT) and the related maturity scale. Select the length interval in which the individuals should be placed (minimum length (MIN.LEN) and the maximum length (MAX.LEN).

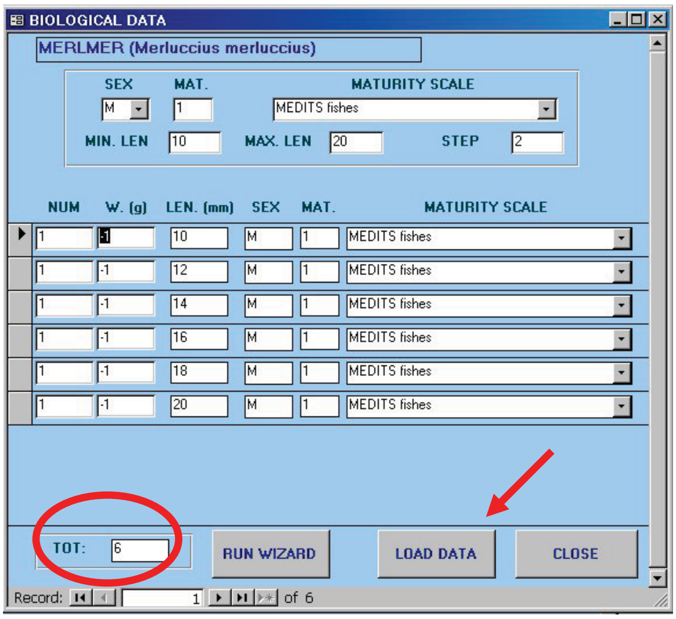
Please note that if a maturity scale value is missing the system will display the following warning message.



Select a STEP: this number indicates the step of the length class is to be selected (e.g. if step is = 5, ATrIS will automatically generate length class 5 by 5 (10-15-20-25-30….).

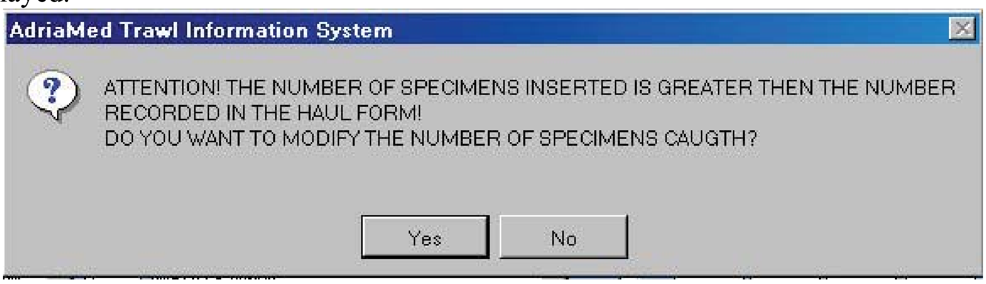
Modify the number of specimens if more than one individual is in a given length class.

Then click on RUN WIZARD. The information selected will be showed indicating the total number of individuals added.



At this point it is possible to load the data in the system by clicking on the LOAD DATA button.

A warning message indicating that the number of specimens inserted has been changed will be displayed.



Please note that if the values inserted do not follow the rules indicated by the Administrator the following message can be shown.



6.5 Data validation system

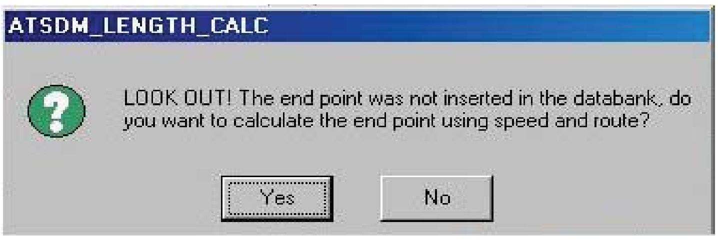
The data validation system comprises a controlled data entry system (which verifies field consistencies) and illegal data checks which filters values that are literally impossible for the actual phenomenon of interest. Hereunder a list, divided by topic, of typical warning or error message that could be displayed by ATrIS is given.

HAUL LENGTH

When calculating the haul length e series of error messages could be shown.
If the Speed and Duration method is selected and the SPEED and/or DURATION fields are not completed the system will advise you.



If the ArcView method is selected and the END POINT is not inserted the system can calculate it. Click YES if the end point has to be calculated by the system. Click NO to modify and insert the correct value in the field END POINT.

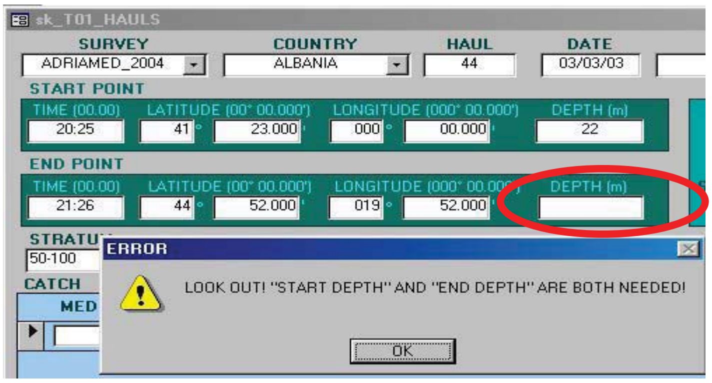


START POINT END POINT

If the start point or the end point fields are not completed a series of error messages will appear.

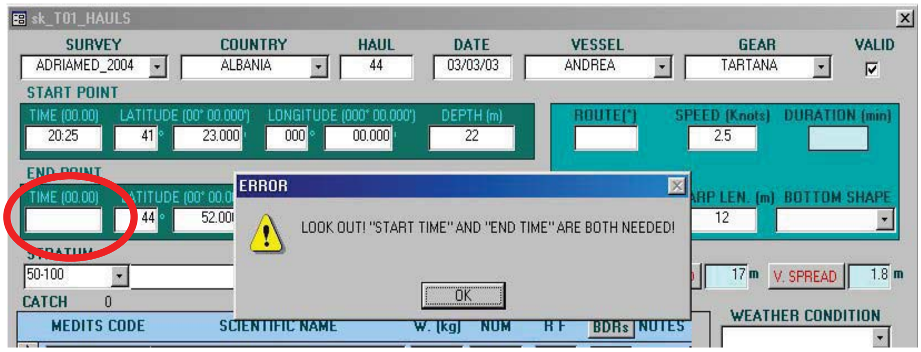
DEPTH

If the depth field is not complete (e.g. the end depth is missing) the error message will inform the user.



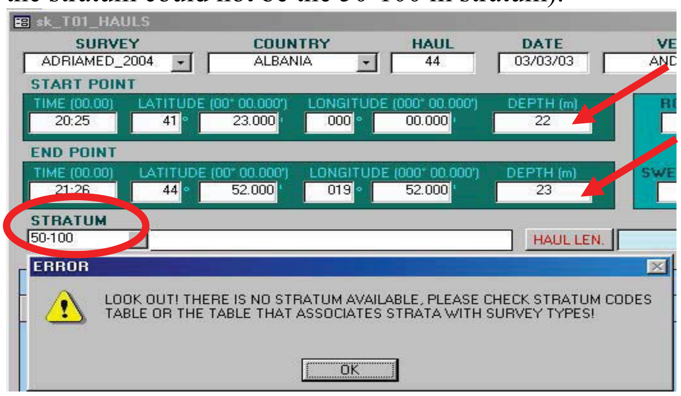
TIME

If the fields related to the time are not completed the error message shown below will appear.



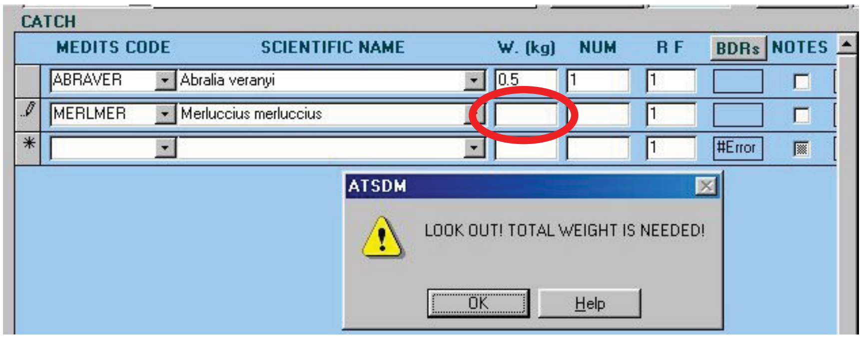
STRATUM

If a stratum not included in the setup, or a wrong value is inserted in the field, the error message below will inform the user (e.g. in the example below the start depth in 22 and the end depth is 23 so the stratum could not be the 50-100 m stratum).

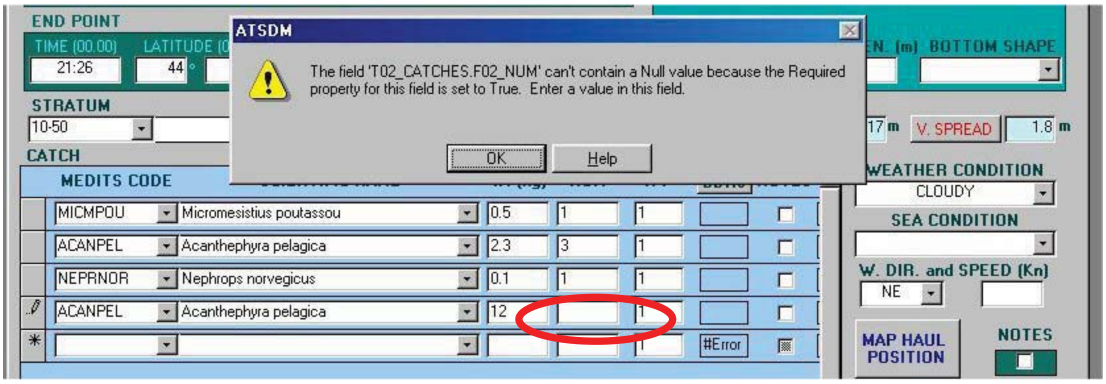


BIOLOGICAL DATA
Insert the data related to a single species one by one.

WEIGHT
If the weight is missing (or if no available the value –1 is not set) the error box shown below will be opened.

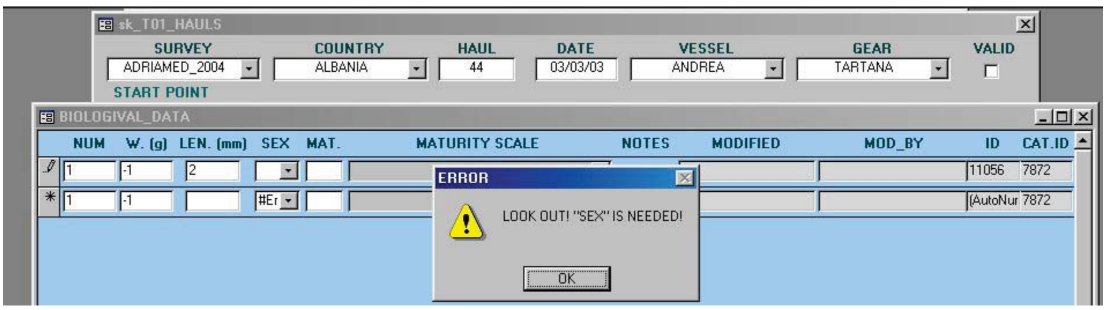


LENGTH
If the length is missing an Access error box will appear. Click on OK and add the length value. By default the field length is different from zero, therefore any time the length measure is equal to zero the error box will appear.



To insert biological data related to a target species double click on the species name and the mask for the biological data will be opened. A series of controls are located in this section to help the error control.

SEX
If the sex is missing the error message will appear.



SEX/MATURITY SCALE

If the sex does not match with the maturity scale chosen a error message will be displayed (e.g. if Indiscriminate is selected in the sex field a maturity scale cannot be stored). Please check that the maturity scale configured in the Set up Panel (see para 4) contains the stage you indicated.



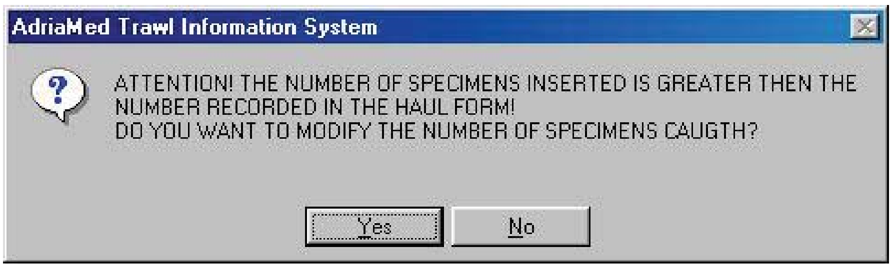
MATURITY SCALE

If a wrong value in the maturity scale is inserted (e.g. higher than the maximum stage of the scale, on a scale 1-4 stage a value of 7) the error message below will be displayed.



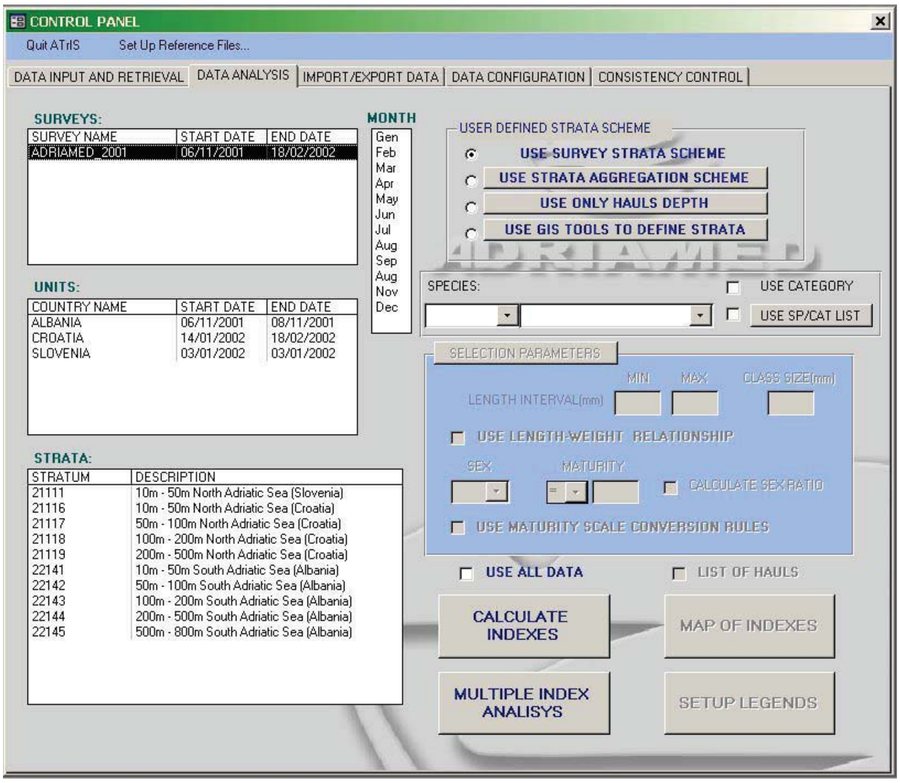
NUMBER

If the number of specimens inserted is higher than that specified in the total catch the following warning message will appear asking to modify the number of specimen in the total catch or to delete the specimens. (e.g. in the total catch there are 12 *Merluccius merluccius* and in the biological data mask there are 13 specimens)



7. Data Analysis

The Data Analysis panel allows users to run routines to analyze stored data. Using this panel the following analysis can be performed: Length Frequency distribution, Sex ratio, Length frequency/Maturity scale, Length frequency/Sex, Biomass/Abundance Indexes, CPUE.



On the left side of the panel the SURVEYS, UNITS and STRATA are displayed. On the right side there are some tools to customize the queries and define the selection parameters.

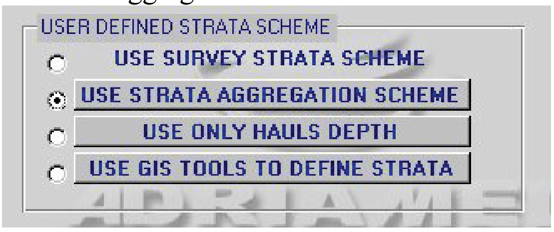
The following general step should be followed to perform the analysis of data.

1) Select the Strata scheme (USER DEFINED STRATA SCHEME, see para 7.1).
2) Select SURVEYS. Please note that a multiple choice can be performed.
3) Select MONTH (if applicable)
4) Select UNITS. Please note that a multiple choice can be performed.
5) Select the STRATA stratum/strata (a multiple selection is possible).
6) Select a species or category (if applicable, see para 7.2).
7) Select parameters for the species or category (if applicable, see para 7.2.1).
8) Click on the CALCULATE INDEXES/MAP INDEXES/MULTIPLE INDEX ANALYSIS buttons (see para 7.5 and 7.6).

For each section please refer to the paragraphs below.
Please note that these examples are valid whichever to the strata scheme is used.

7.1 User defined strata scheme

ATrIS was designed to store data from the AdriaMed Trawl Surveys. However the possibility to include data from other database or archives has been included. Thus the data analysis routine allows users to use the defined strata scheme applied during the surveys of AdriaMed or to use a user-defined scheme of aggregation.



Hereunder the available options are listed and illustrated:
-Use survey strata scheme
-Use strata aggregation scheme
-Use only hauls depth
-Use GIS Tools to define strata

7.1.1 Use survey strata scheme

With regard to station selection and geographical allocation, random depth-stratified sampling design was applied to the AdriaMed Trawl Survey, the same as is used in the case of the MEDITS programme in the Adriatic (Anonymous, 1998).

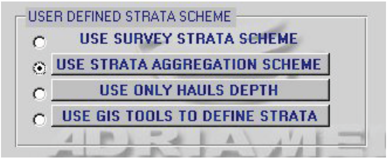
Strata were defined according to the following bathymetric limits:
10-50 (GSA 17, GSA 18)
50-100 (GSA 17, GSA 18)
100-200 m (GSA 17, GSA 18)
200-500 m (GSA 18).
500-800 m (GSA 18).

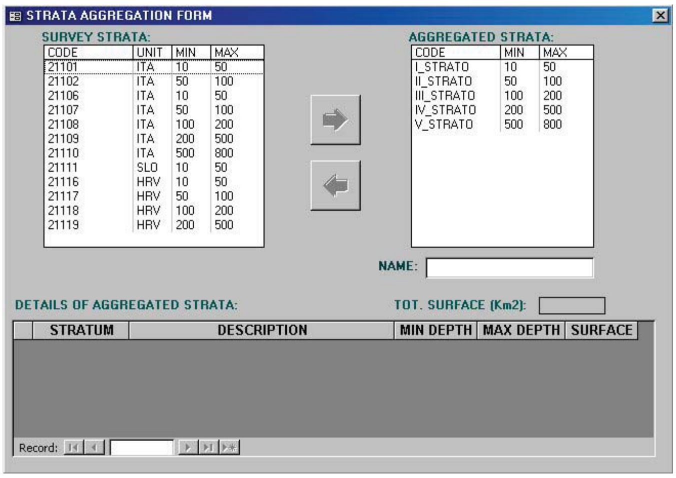
The USE SURVEY STRATA SCHEME allows performing data analysis on the strata defined during the surveys. The procedure is the same as that reported in para 7.5.

7.1.2 Use strata aggregation scheme

ATrIS allows the user to choose the survey strata scheme as given by the AdriaMed Trawl survey protocol.
The procedure permits the modification of the survey strata available and the aggregation of new strata indicating

1. Check on USE STRATA AGGREGATION SCHEME
2. Click on USE STRATA AGGREGATION SCHEME (the window STRATA AGGREGATION FORM will be opened).



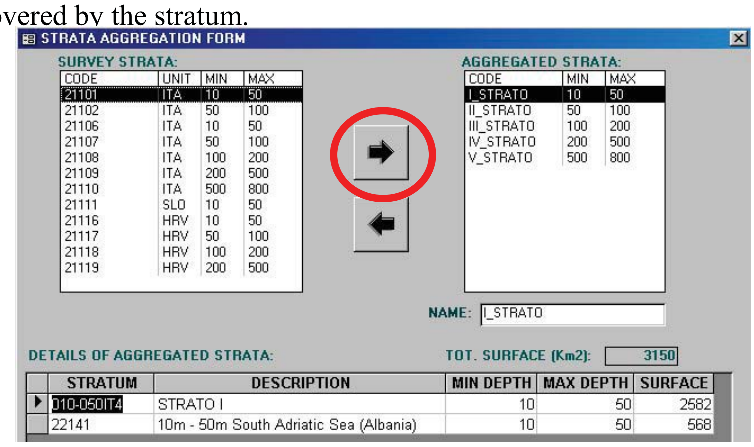


3. Select the strata to aggregate (e.g. 10-50 m of different units)

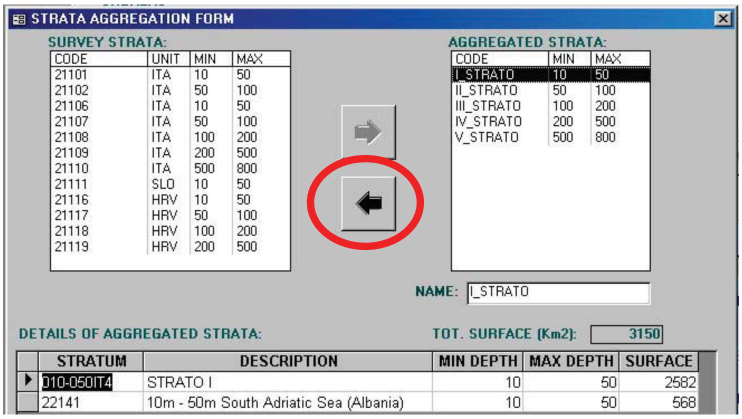
4. Give a name to the new aggregated strata. If this step is skipped a warning message will appear.



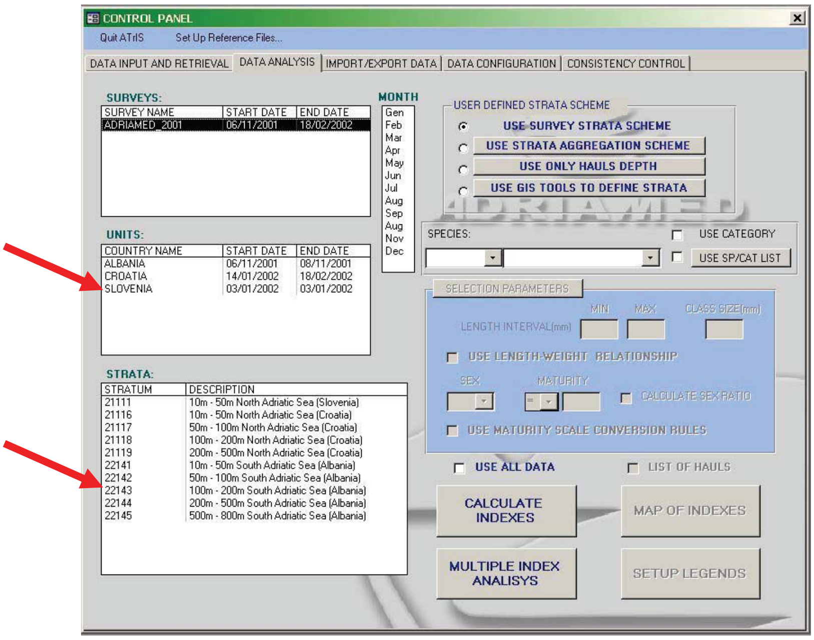
5. Click on the right arrow. The strata selected will be automatically displayed in the right box AGGREGATED STRATA, disappearing from the left box. Details on the aggregated strata will be displayed at the bottom of the window showing the stratum, the stratum description, the depth range (minimum and maximum depth of the selected stratum) and the surface covered by the stratum.



Please note that to change/delete strata already aggregated the aggregation should be dissolved. Select the strata to be disaggregated and click on the left arrow. The aggregated strata will disappear and the original strata will be displayed again in the SURVEY STRATA box.



Once the new aggregation scheme is configured the DATA ANALYSIS Panel will change: the UNITS box will be disabled (the UNITS are only related to the survey strata scheme) and the new strata scheme will be shown.

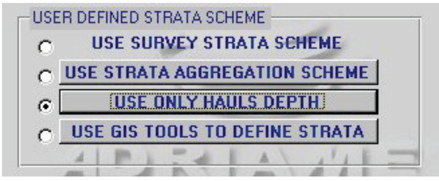


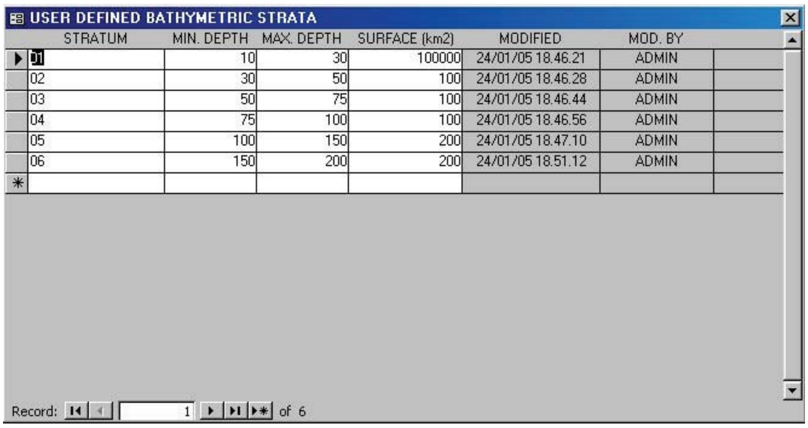
The data can now be processed using the new strata aggregation scheme as described in para 7.5.

7.1.3 Use only hauls depth

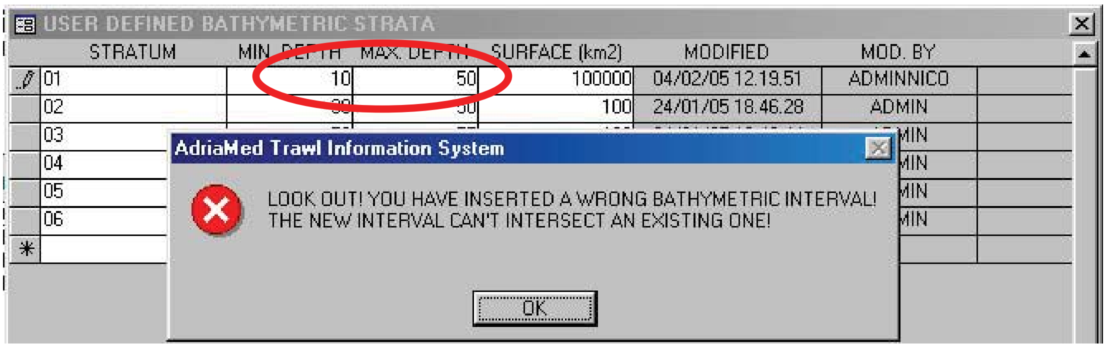
The third option to define a strata scheme allows the user to customize the strata by choosing the range of depth on which to focus the query.

1. Check on USE ONLY HAULS DEPTH
2. Click on USE ONLY HAULS DEPTH (the window USED DEFINED BATHYMETRIC STRATA will be opened).

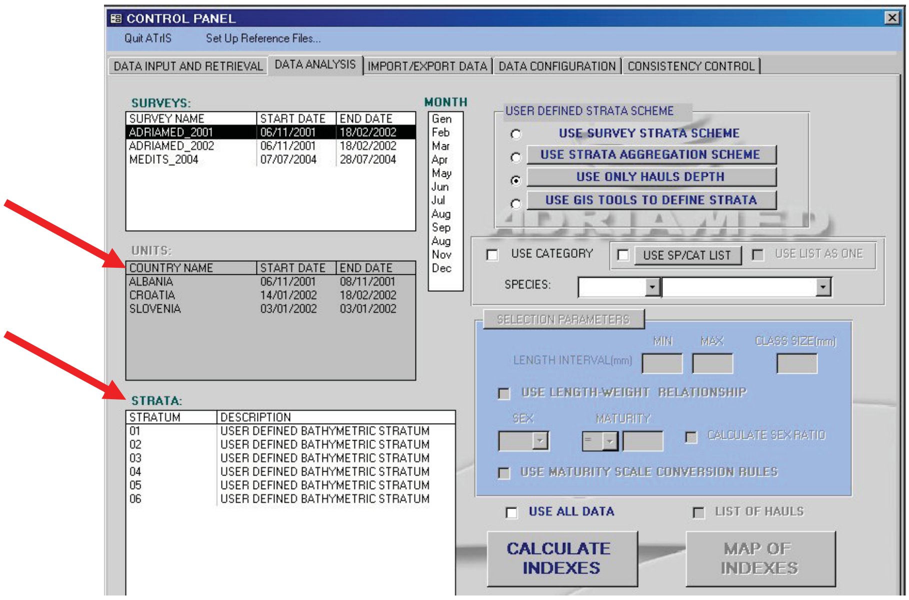




Please note that the interval should be defined in a range which is different from the existing survey strata scheme (e.g. a new stratum between 10 and 50 m cannot be selected because it is already used by the survey strata scheme). An error message will be displayed.



Once the new aggregation scheme is configured the DATA ANALYSIS Panel will change: the UNITS box will be disabled (the UNITS are only related to the survey strata scheme) and the new strata scheme will be shown.



When the new strata are defined the data can be processed using the new strata aggregation scheme as given in para 7.6.

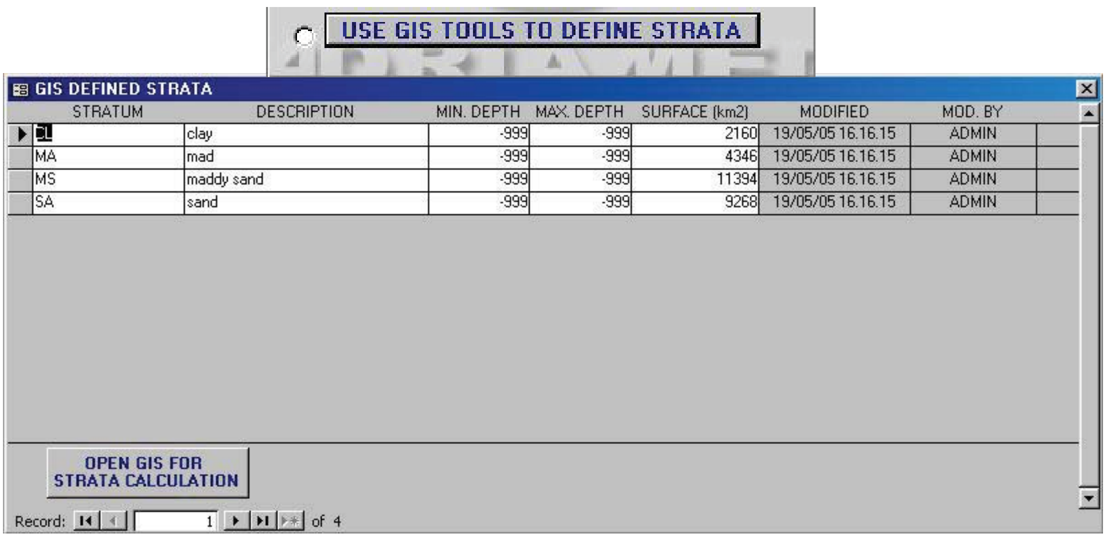
7.1.4 Use GIS Tools to define strata

This option is one very powerful feature of ATrIS which allows users to define strata with particular characteristics. The tools set up contains a sample theme map but the users knowledgeable in GIS can employ additional theme if they wish to work with the data more independently (for more details see para 7.9).

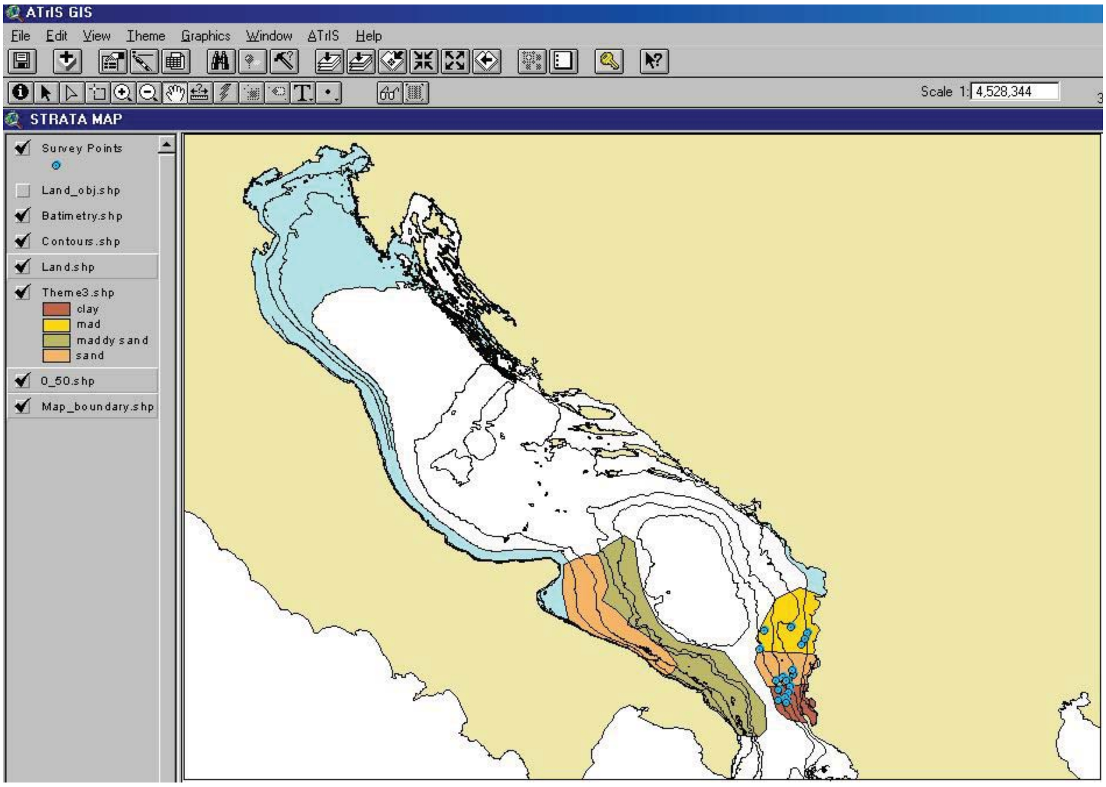
Here is a guided example to use the theme provided by ATrIS.

1) Select a Survey (i.e. AdriaMed 2001)
7) Select a Country (i.e. Albania)

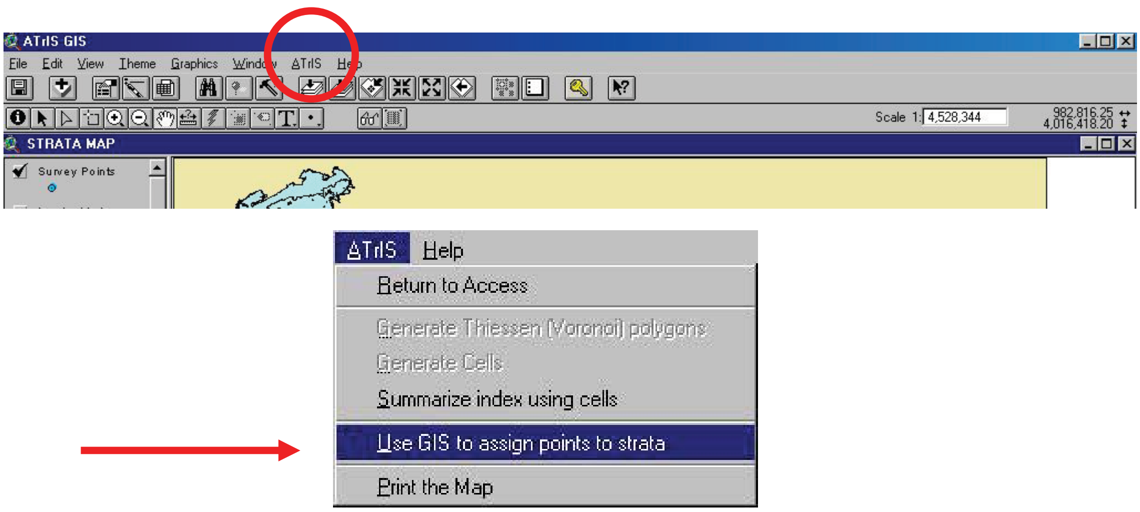
Click on USE GIS TOOLS TO DEFINE STRATA button. A table will be displayed showing a strata defined by bottom sediment type. Minimum and maximum depth value and surface of the new strata may not be modified if this strata example is used.



8) Click on OPEN GIS FOR STRATA CALCULATION button. ATrIS will launch ArcView and the following map will be shown.



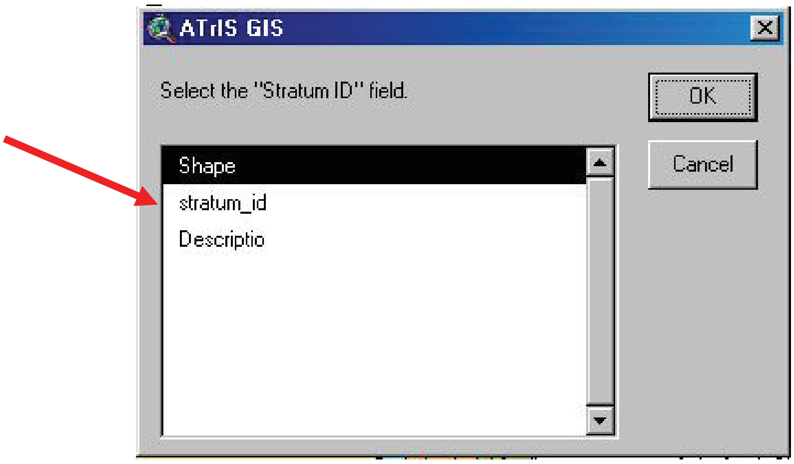
9) Click on the MENU bar on ATrIS and select the USE GIS to assign point to strata.



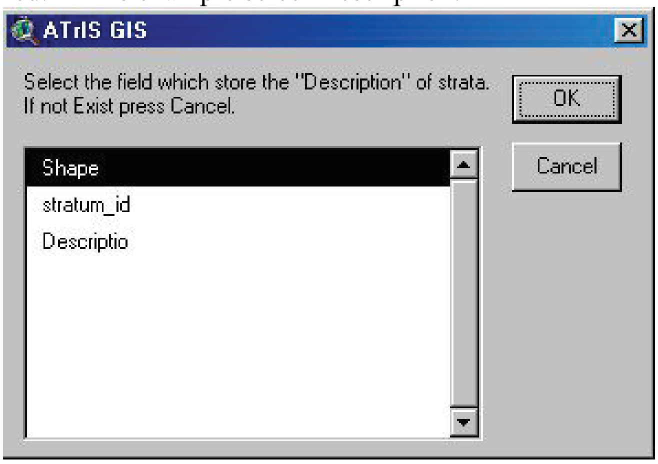
10) A table will be shown to select the theme to be used as "Strata theme". Select theme3.shp and click OK.



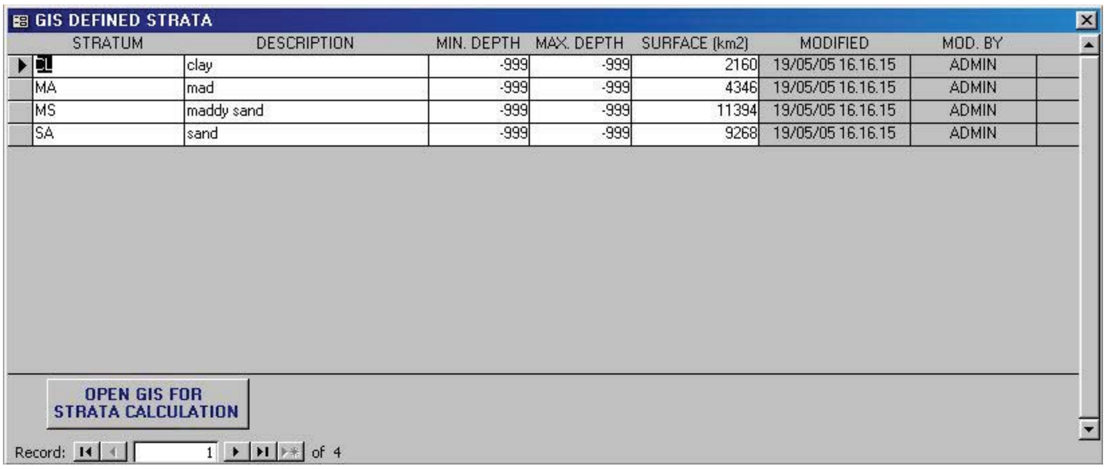
11) A second table will be opened asking to select the "Stratum ID" field. Select stratum_id and click OK.



12) A third table will be shown. If available select the field in which the description data are stored. In this example select Description.

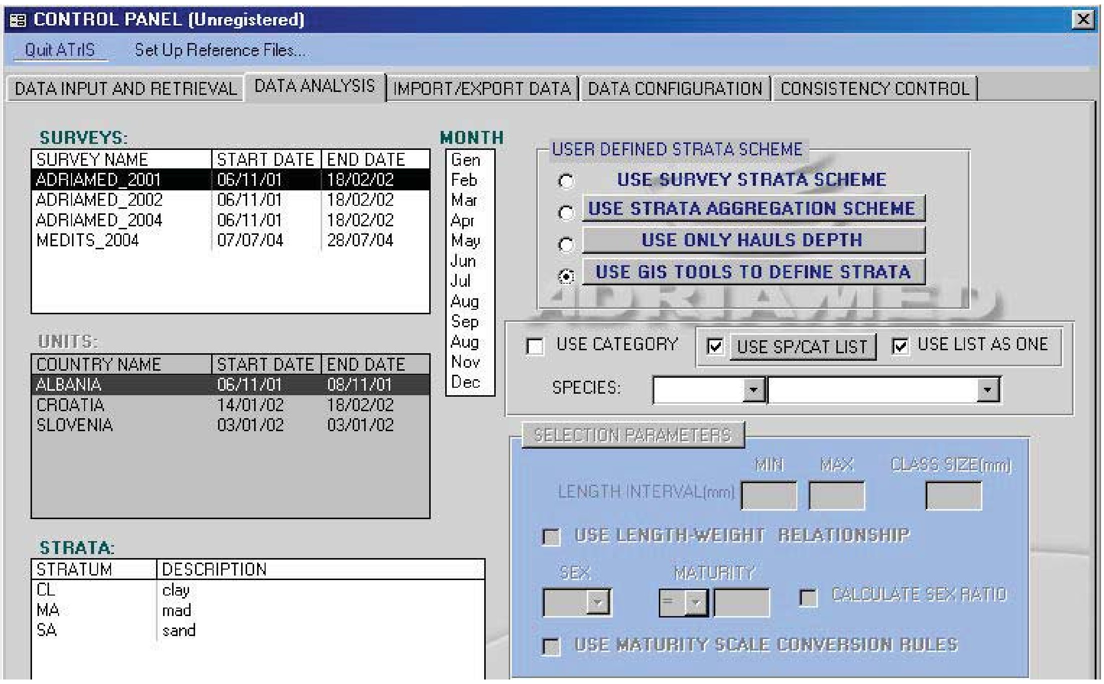


13) Now ATrIS will automatically calculate the new strata definition and will create a table with data on the new defined strata. In this example the table corresponds to the original showed in point 3 since no changes have been made.



14) Close the window and check the option button  . The new defined strata will be shown in the STRATA mask.

15) Now that the new strata are defined the data can be processed using the new strata aggregation scheme as reported in para 7.6.



7.2 Define species or category

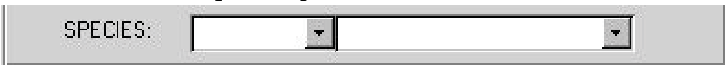
The data can be filtered if just one species or category is to be analyzed. The scroll bar allows the user to select from the list of all the species that result from the choice made.

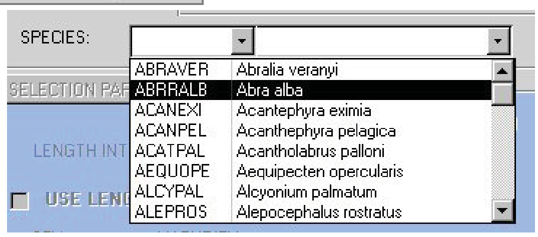


With this option the user has four possibilities:
i) Select just one species/category
ii) Select all the species/category
iii) Select a subsample of species/category (considering them as single species/category, the indexes are calculated species by species/category)
iv) Select a subsample of species/category (considering them as a unique group, the indexes are calculated as a total of a group).

7.2.1 Select a species

To select just on species choose a species name from the scroll bar. Please note that when a species is selected the button SELECTION PARAMETERS (see para 7.2.1) will be activated as well as the corresponding section in blue.

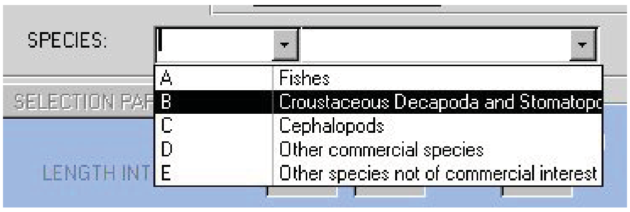




Please note that to visualize data of all the species no species should be selected in the scroll bar.

7.2.2 Select a category

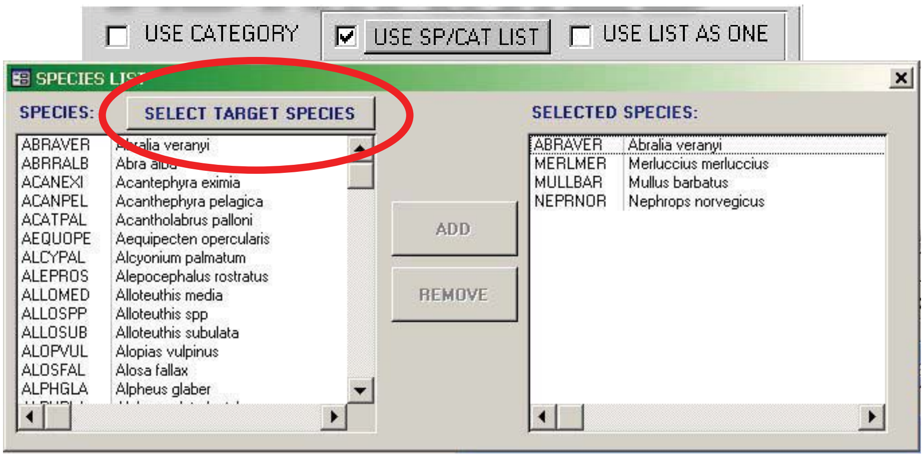
The data can be filtered by category (see Chapter 4, para 4.8 for the category classification). Clicking on the check USE CATEGORY, the scroll bar will automatically display the category configured during the DATA CONFIGURATION (see para 4.8).



To select just one category choose from the scroll list bar. Please note that to visualize data of all the categories the USE CATEGORY should be checked and no categories should be selected in the scroll bar.

7.2.3 Select use species and category list

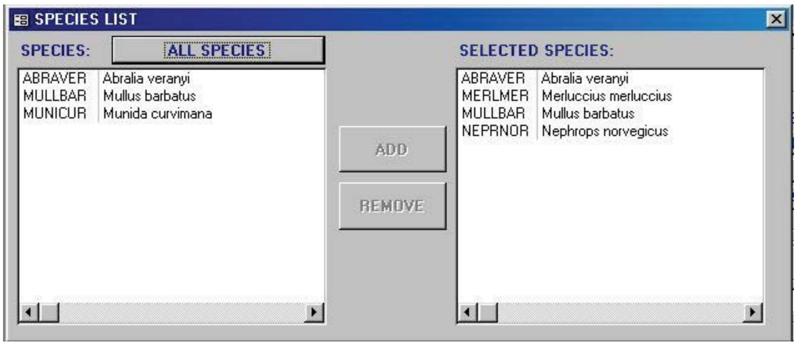
ATrIS permits multiple choice for both the species and categories. If check the USE SP/CAT LIST options and click on the relative button the following mask will be displayed.



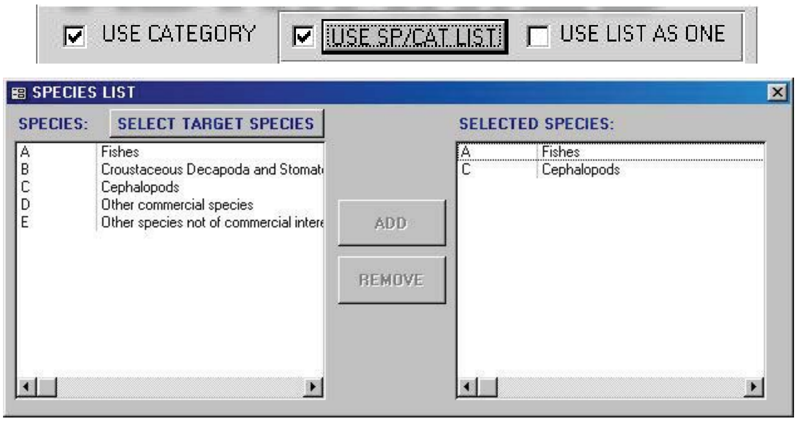
It is possible to select those species on which the data analysis should be run by select the name and click on the ADD button. The selected species will be displayed in the SELECTED SPECIES field.

To remove a species name, select the species in the SELECTED SPECIES field and click on the REMOVE button.

The list can be further filtered by target species if click on SELECT TARGET SPECIES. The mask will only show the list of the target species defined during the data configuration (see para 4.11).



If the USE CATEGORY check is on the USE SP/CAT LIST will display the list of category, and a multiple choice for category is possible.

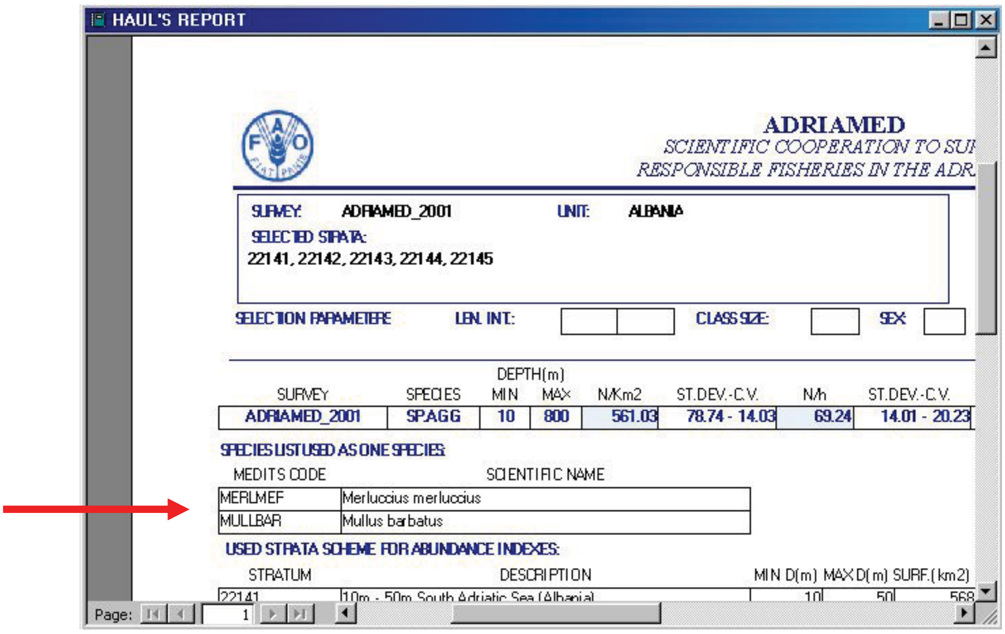


7.2.4 Use list as one



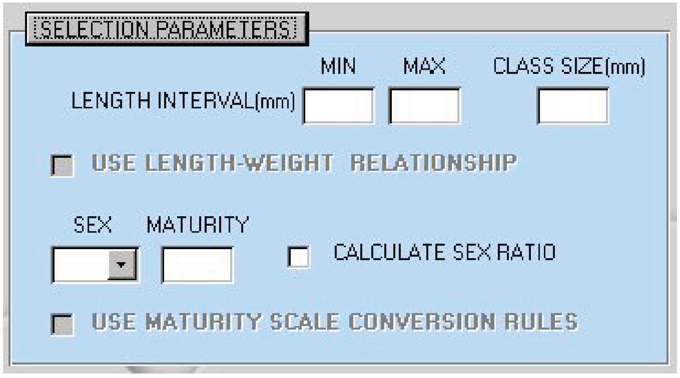
The USE LIST AS ONE option is just activated when a multiple choice has been selected (USE SP/CAT LIST checked). With this option the selection made in the USE SP/CAT LIST (see para 7.2.3) can be considered as a single group of species/categories and the information about the single species/category is missed.

For example if the selection comprise two species, i.e. *Merluccius merluccius* and *Mullus barbatus*, the indexes will be calculated as a total indexes of both species as a single group. In this case the species will be displayed on the report as aggregated species (SP.AGG) and a box indicating the species which were selected for the aggregation will be included.



7.3 Selection parameters

When a species is selected the button SELECTION PARAMETERS will be activated. Click on the button and the corresponding section will be activated/disabled.



The data can be thus filtered defining:
--Length interval and/or the class size;
--Sex and maturity and/or the sex ratio.
Two more options help user to define length interval using the L/W relationship or to define sex and maturity using the maturity scale conversion.

LENGTH

The data on the selected species can be redefined if a length interval is chosen. Insert in the two boxes (MIN and MAX) the length range in which to limit the analysis and perform the data analysis (see para 7.5).

Please note that if a length interval is selected the analysis will only be carried out on the portion of the population with the selected characteristics (e.g. if *Merluccius merluccius* has been selected and the length interval chosen is between 10 and 100, the data will be analyzed and the indexes will be calculated just for specimens included between 10 and 100 mm).

CLASS SIZE

The data on the selected species can be limited to a particular class size (mm): select a range and the data will be automatically calculated and displayed on the basis of the class size range chosen. In this case all the data population will be aggregated in the class size selected.

Please note that if original data are already aggregated in class size additional assemblage in class size may be only carried out if the new class size is a multiple of the original class (e.g. if original data are aggregated by 10 class size, the data can be allocated in new classes size of 10, 20, 30 etc. but a class size of 15 cannot be chosen).

Moreover note that the opposite is not possible: if the original data are aggregated in a class size of 10 a new class size of 5 cannot be selected.

The LENGTH INTERVAL and the CLASS SIZE may be combined. Select both the parameters and the data will be calculated and displayed for the length interval and the class size chosen (e.g. if the length interval selected is 10-100 mm and the class size is 10, the data on *Merluccius merluccius* will be limited to the 10-100 portion of the population and will be shown in class size of 10 mm).

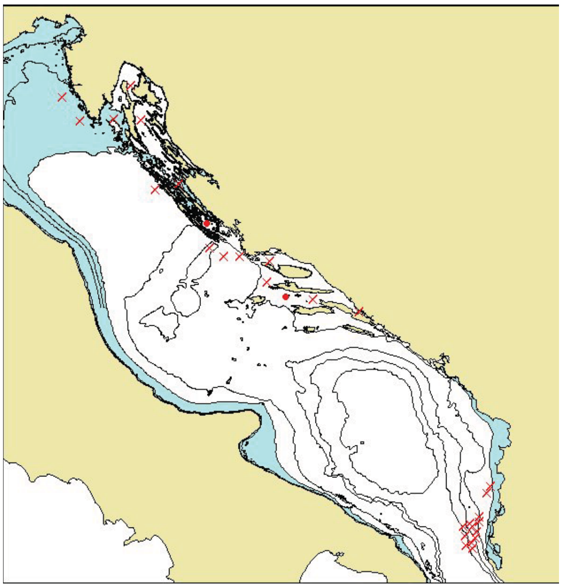
Please note that if length interval and/or class size are selected ,a length frequency analysis will be carried out.

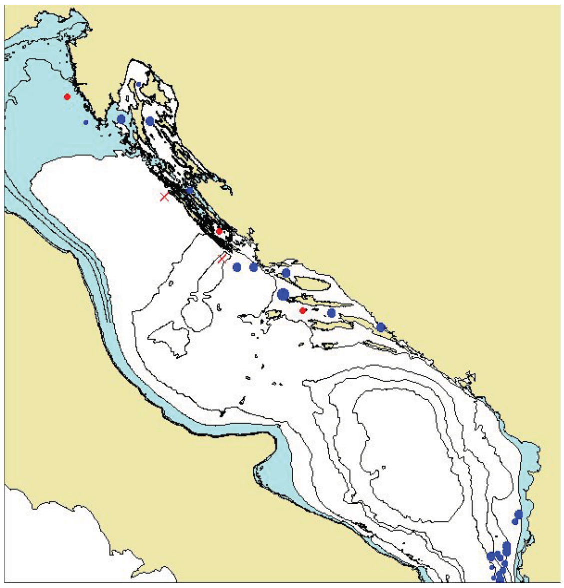
USE LENGTH/WEIGHT RELATIONSHIPS

This option is activated only if a length interval is selected. When only length data are available, ATrIS will automatically estimate weight data, using the Length/Weight Relationships

$W=a\ L^b$

The parameters a and b are those inserted during the data configuration (see Chapter 4, para 4.9). Hereunder there are two examples. The first example shows the biomass indices (kg/km2) plotted using the GIS tools: the data are not available and are displayed with the symbol X on the map. The second map has been generated using the LENGTH/WEIGHT RELATIONSHIPS option. The data are estimated and displayed on the map.





SEX, MATURITY SCALE, SEX RATIO

The data can be displayed by sex (see Chapter 4, para 4.12 for the definition of sex class). Select the sex to limit the analysis and eventually the maturity scale stage (see Chapter 4, for the definition of the maturity scale).
The data can be displayed by sex ratio. Please note that if a sex is selected and the sex ratio is chosen the system will only display data referred to the selected sex and not the sex ratio.

USE MATURITY SCALE CONVERSION RULES

This option is activated when a sex and a maturity scale are selected. If the data were processed using a different maturity scale this option allows the use of conversion rules determined during the DATA CONFIGURATION. The indexes will be thus calculated using the new maturity scale.

7.4 Use all data

This check allows the use of all the data of the surveys selected. It can be applied when two or more surveys are chosen. An example will clarify the use of this option.



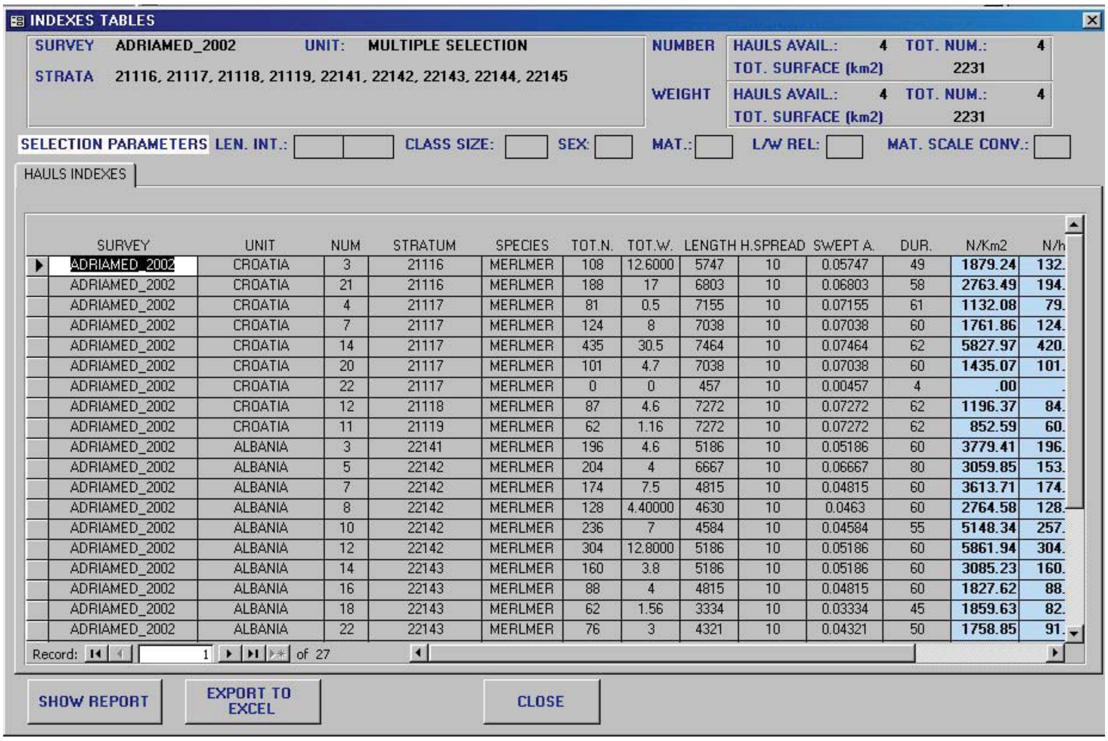
Choose a survey A and then a survey B. The survey A has two units (a, b) and the survey B has the same units a and b and a third one, c: only the common units will be displayed in the window UNITS and used for the data analysis performance.

To perform a data analysis using all the data please check the USE ALL DATA and all the units will be used (a, b and c).

Please note that when the option USE ALL DATA is active the button CALCULATE INDEXES will be disabled. Use the button MAP INDEXES to estimate and visualize the data analysis.

7.5 List of hauls

This option allows the user to calculate indexes for each haul present in the survey/units/stratum selected.



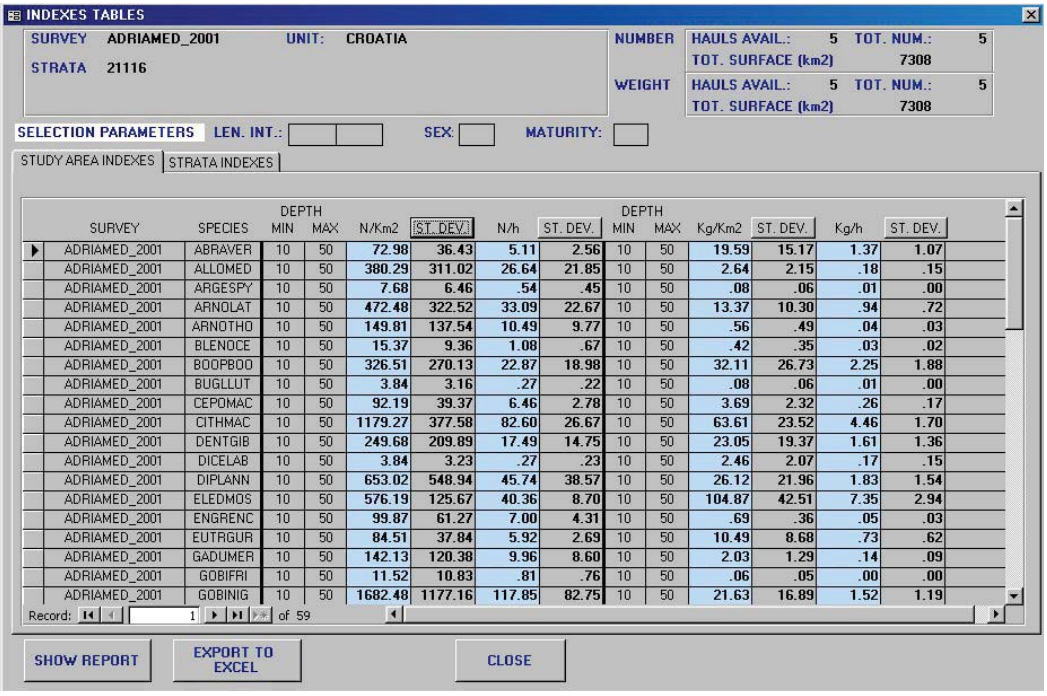
SURVEY	UNIT	NUM	STRATUM	SPECIES	TOT.N.	TOT.W.	LENGTH	H.SPREAD	SWEPT A.	DUR.	N/Km2	N/h
ADRIAMED_2002	CROATIA	3	21116	MERLMER	108	12.6000	5747	10	0.05747	49	1879.24	132.
ADRIAMED_2002	CROATIA	21	21116	MERLMER	188	17	6803	10	0.06803	58	2763.49	194.
ADRIAMED_2002	CROATIA	4	21117	MERLMER	81	0.5	7155	10	0.07155	61	1132.08	79.
ADRIAMED_2002	CROATIA	7	21117	MERLMER	124	8	7038	10	0.07038	60	1761.86	124.
ADRIAMED_2002	CROATIA	14	21117	MERLMER	435	30.5	7464	10	0.07464	62	5827.97	420.
ADRIAMED_2002	CROATIA	20	21117	MERLMER	101	4.7	7038	10	0.07038	60	1435.07	101.
ADRIAMED_2002	CROATIA	22	21117	MERLMER	0	0	457	10	0.00457	4	.00	.
ADRIAMED_2002	CROATIA	12	21118	MERLMER	87	4.6	7272	10	0.07272	62	1196.37	84.
ADRIAMED_2002	CROATIA	11	21119	MERLMER	62	1.16	7272	10	0.07272	62	852.59	60.
ADRIAMED_2002	ALBANIA	3	22141	MERLMER	196	4.6	5186	10	0.05186	60	3779.41	196.
ADRIAMED_2002	ALBANIA	5	22142	MERLMER	204	4	6667	10	0.06667	80	3059.85	153.
ADRIAMED_2002	ALBANIA	7	22142	MERLMER	174	7.5	4815	10	0.04815	60	3613.71	174.
ADRIAMED_2002	ALBANIA	8	22142	MERLMER	128	4.40000	4630	10	0.0463	60	2764.58	128.
ADRIAMED_2002	ALBANIA	10	22142	MERLMER	236	7	4584	10	0.04584	55	5148.34	257.
ADRIAMED_2002	ALBANIA	12	22142	MERLMER	304	12.8000	5186	10	0.05186	60	5861.94	304.
ADRIAMED_2002	ALBANIA	14	22143	MERLMER	160	3.8	5186	10	0.05186	60	3085.23	160.
ADRIAMED_2002	ALBANIA	16	22143	MERLMER	88	4	4815	10	0.04815	60	1827.62	88.
ADRIAMED_2002	ALBANIA	18	22143	MERLMER	62	1.56	3334	10	0.03334	45	1859.63	82.
ADRIAMED_2002	ALBANIA	22	22143	MERLMER	76	3	4321	10	0.04321	50	1758.85	91.

7.6 Calculate Indexes

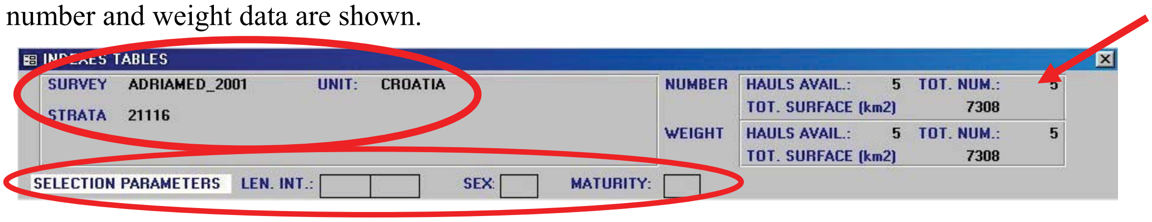
The button CALCULATE INDEXES starts the calculation of the abundance/biomass indices and CPUE.



When click on the CALCULATE INDEXES button a window will be opened.



In the upper part of the window a summary of the selection made is reported. On the left hand side the Survey, Unit and Strata selected are given. On the right hand side the information on number and weight data are shown.



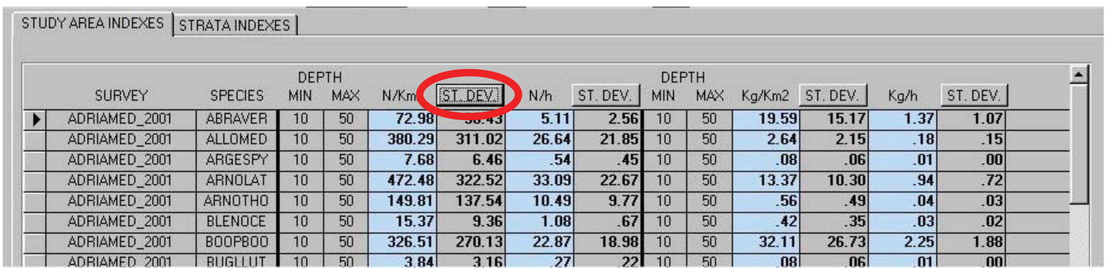
For both the data the hauls available (HAULS AVAIL.), the number of hauls used (TOT NUM) for the estimation and the total surface (TOT. SURFACE (km2)) are given.

Please note that the HAULS AVAIL represents the number of all the hauls in the stratum selected (5 in the stratum 21116: 10-50m). TOT NUM represents the number of hauls used to perform the estimation of the indexes. For example in the AdriaMed surveys, only number data are available (e.g. weight data are not recorded for single specimens): the number of hauls available for the indexes calculated on a number bases is different from that on which the indexes will be calculated on a weight basis.
The window also shows the selection parameters selected during the query to define the query on the species selected: Length interval used (LEN.INT), Sex (SEX) and the maturity (MAT.) selected, the class size selected (CLASS SIZE), the length/weight relationships (L/W REL.) and the maturity scale conversion (MAT. SCALE CONV) if used.

At the bottom of the window the data calculated are displayed: from two to four folders may be visualized: STUDY AREA INDEXES, STRATA INDEXES, TIME SERIES, LENGTH FREQUENCY, SEX RATIO and HAUL INDEXES.

In the STUDY AREA INDEXES data for each species in the chosen interval of strata (e.g. if the strata 10-50 and 50-100 are selected a unique study area will be calculated between 10 and 100 m) considered as a unique study area are calculated.

In the STRATA INDEXES data for each species/selected species in the stratum considered are given.
In the HAULS INDEXES data for each species/selected species in the hauls considered are shown.



SURVEY	SPECIES	DEPTH MIN	DEPTH MAX	N/Km	ST. DEV.	N/h	ST. DEV.	DEPTH MIN	DEPTH MAX	Kg/Km2	ST. DEV.	Kg/h	ST. DEV.
ADRIAMED_2001	ABRAVER	10	50	72.98	[illegible]	5.11	2.56	10	50	19.59	15.17	1.37	1.07
ADRIAMED_2001	ALLOMED	10	50	380.29	311.02	26.64	21.85	10	50	2.64	2.15	.18	.15
ADRIAMED_2001	ARGESPY	10	50	7.68	6.46	.54	.45	10	50	.08	.06	.01	.00
ADRIAMED_2001	ARNOLAT	10	50	472.48	322.52	33.09	22.67	10	50	13.37	10.30	.94	.72
ADRIAMED_2001	ARNOTHO	10	50	149.81	137.54	10.49	9.77	10	50	.56	.49	.04	.03
ADRIAMED_2001	BLENOCE	10	50	15.37	9.36	1.08	.67	10	50	.42	.35	.03	.02
ADRIAMED_2001	BOOPBOO	10	50	326.51	270.13	22.87	18.98	10	50	32.11	26.73	2.25	1.88
ADRIAMED_2001	BUGLLUT	10	50	3.84	3.16	.27	.22	10	50	.08	.06	.01	.00

The data displayed/calculated are the following:

Field	Description
Survey	The selected survey
Species	All the species (if a species is selected this field displays just the selected species, see Example C)
Depth MIN	The minimum depth of the selected stratum
Depth MAX	The maximum depth of the selected stratum
N/Km2	The number of individuals per surface unit
ST/DEV (CV%)	The standard deviation of the N/Km2 value. To visualize the Coefficient of Variation (CV%) click on the button.
N/h	The number of individuals per unit of time (hours)
ST/DEV	The standard deviation of the N/h value. To visualize the Coefficient of Variation (CV%) click on the button.
Depth MIN	The minimum depth of the selected stratum
Depth MAX	The maximum depth of the selected stratum

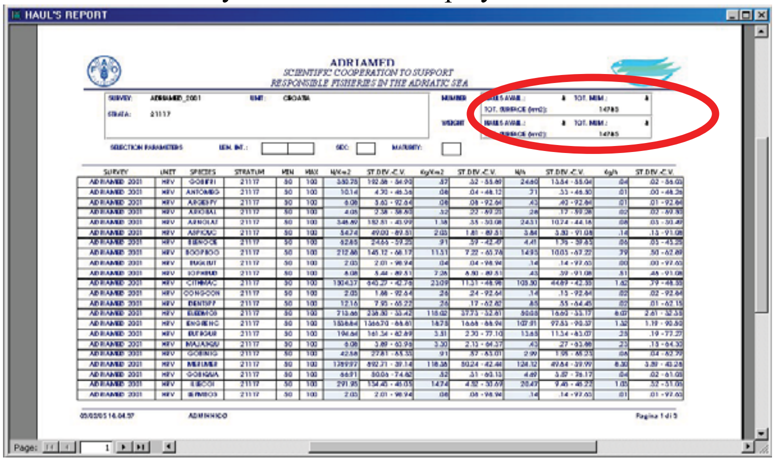
Kg/Km2	The biomass (Kg) of individuals per surface unit (Km2)
ST/DEV (CV%)	The standard deviation of the Kg/Km2 value. To visualize the Coefficient of Variation (CV%) click on the button.
Kg/h	The total weight (kg) of individuals per unit of time (hours)
ST/DEV (CV%)	The standard deviation of the Kg/h value. To visualize the Coefficient of Variation (CV%) click on the button.

At the bottom of the window there are three buttons:
SHOW REPORT: visualize the report with all the data
EXPORT TO EXCEL: export data to an excel file
CLOSE: close the window.

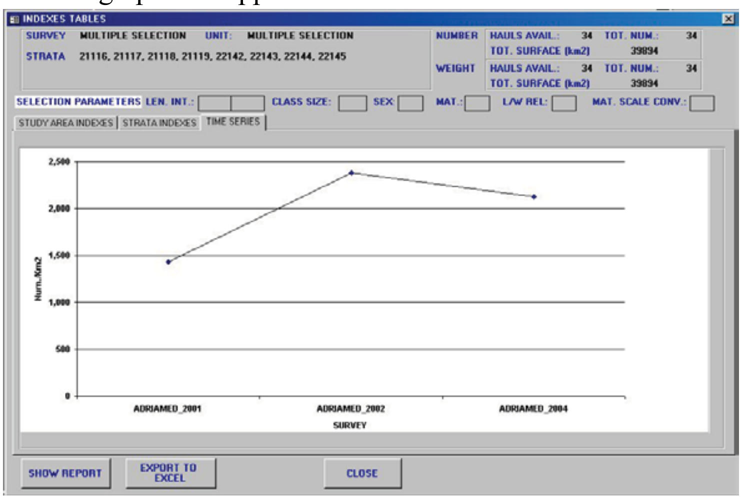


SHOW REPORT

The report shows in a similar way the same data displayed in the window.



In the TIME SERIES (e.g. only if two or more surveys are selected) a graph showing the indexes per single survey is given (to scroll all the indexes click on the top of the TIME SERIES window: a new graph will appear.

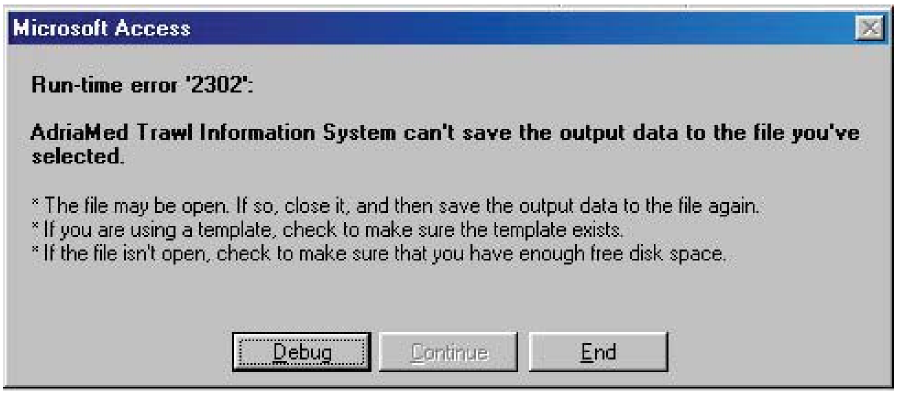


EXPORT TO EXCEL:

If click on the button EXPORT TO EXCEL a new EXCEL file will be automatically opened reporting the data in the same order in which are displayed in the ATrIS window.

Remember to save the data using the command "SAVE AS" of Excel.

Please note that the file on which the system exports data is always the same: if the file used to export a set of data remains opened and a new set of data have to be exported, the system will show a error message.



7.6.1 Indexes Calculation

ATrIS estimate the abundance/biomass indexes using the formula reported by Cochran, 1977, modified by Souplet 1996.

Abundance indices

The calculations of abundance indices based on density (Number/kg of individuals per surface) are hereunder reported:

A	total surface of the area
N	number of strata in that area
A_i	surface of the stratum i
W_i	relative weight of the stratum i in the area
n_i	number of hauls in the stratum i
$A_{i,j}$	surface trawled by the haul j in the stratum i
f_i	sampling fraction in the stratum i
$x_{i,j}$	measured value in the haul j

with $W_i = \frac{A_i}{A}$ and $f_i = \frac{\sum_{j=1}^{n_i} A_{i,j}}{A_i}$

It is possible to choose between two options. The first one is to calculate a value by surface unit for each haul and to average those values over all the hauls made in the stratum:

$$y_{i,j} = \frac{x_{i,j}}{A_{i,j}} \quad \text{et} \quad \bar{y}_{i,j} = \frac{\sum_{j=1}^{n_i} y_{i,j}}{n_i}$$

mean value of x by unit of surface in the stratum i : $\bar{x}_i = \frac{\sum_{j=1}^{n_i} x_{i,j}}{\sum_{j=1}^{n_i} A_{i,j}}$

Variance of the value in the stratum i : $\tilde{S}^2{}_{xi} = \frac{1}{n_i - 1} \sum_{j=1}^{n_i} A_{i,j} \left(\frac{x_{i,j}}{A_{i,j}} - \bar{x}_i \right)^2$

Variance of the estimate of the mean : $Var(\bar{x}_i) = \frac{1}{\sum_{j=1}^{n_i} A_{i,j}} \tilde{S}^2{}_{x_i}$

Abundance index in the area : $I = \sum_{i=1}^{N} W_i \bar{x}_i$

Variance of that index: $var(I) = \sum_{i=1}^{N} \frac{W_i^2 \tilde{S}^2{}_{xi}}{\sum_{j=1}^{n_i} A_{i,j}} (1 - f_i)$

CPUE indices

The formulae based on CPUE (weight or number per hour trawling) are very similar to those based on density. The calculation of area indices always uses a weighted average of indices by stratum, using the ratio stratum surface/area surface as weighting factor (Souplet, 1996).

A	total surface of the area
N	number of strata in that area
A_i	surface of the stratum i
W_i	relative weight of the stratum i in the area
n_i	number of hauls in the stratum i
$T_{i,j}$	time trawled during the haul j in the stratum i
f_i	sampling fraction in the stratum i
$x_{i,j}$	measured value in the haul j

with $W_i = \frac{A_i}{A}$ and $f_i = \frac{\sum_{j=1}^{n_i} A_{i,j}}{A_i}$

mean value of x by unit of surface in the stratum i:

$$\bar{x}_i = \frac{\sum_{j=1}^{n_i} x_{i,j}}{\sum_{j=1}^{n_i} T_{i,j}}$$

Variance of the value in the stratum i:

$$\tilde{S}^2{}_{x_i} = \frac{1}{n_i - 1} \sum_{j=1}^{n_i} T_{i,j} \left(\frac{x_{i,j}}{T_{i,j}} - \bar{x}_i \right)^2$$

Variance of the estimate of the mean:

$$\mathrm{Var}(\bar{x}_i) = \frac{1}{\sum_{j=1}^{n_i} T_{i,j}} \tilde{S}^2{}_{x_i}$$

Abundance index in the area:

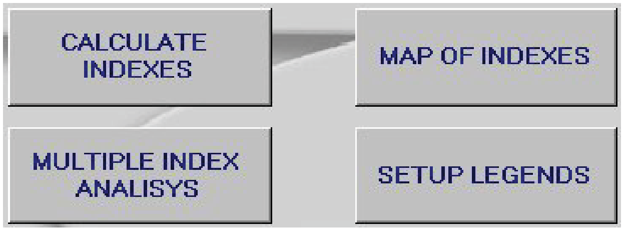
$$I = \sum_{i=1}^{N} W_i \bar{x}_i$$

Variance of that index:

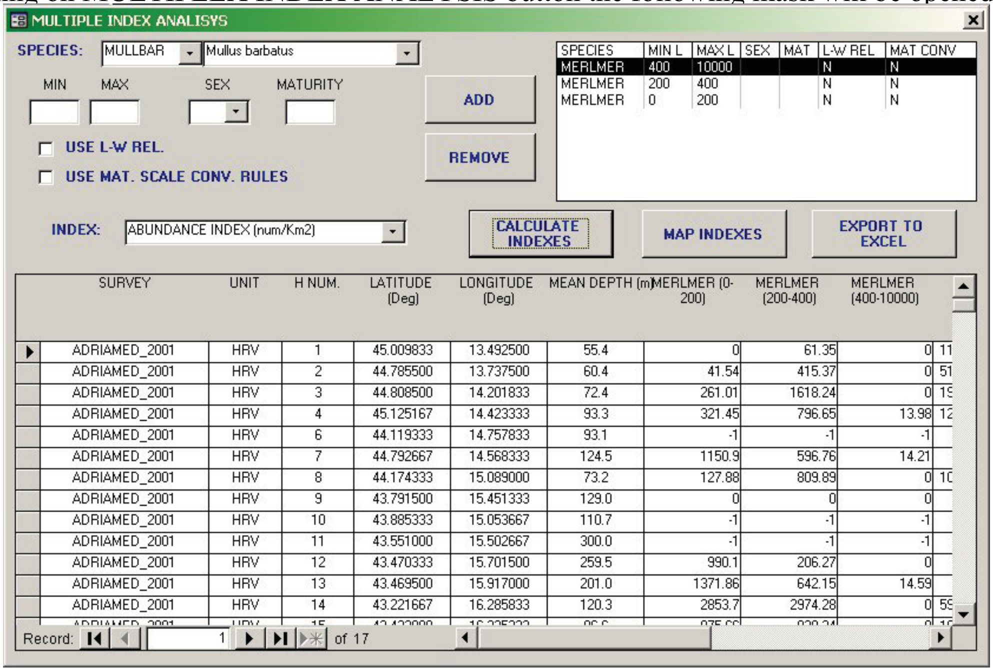
$$\mathrm{var}(I) = \sum_{i=1}^{N} \frac{W_i^2 \tilde{S}^2{}_{x_i}}{\sum_{j=1}^{n_i} T_{i,j}} (1 - f_i)$$

7.7 Multiplex Indexes Analysis

This option permits to calculate indexes of two or more species simultaneously with a wide combination of options or for a single species to calculate the indexes of fraction of the population with different characteristics.

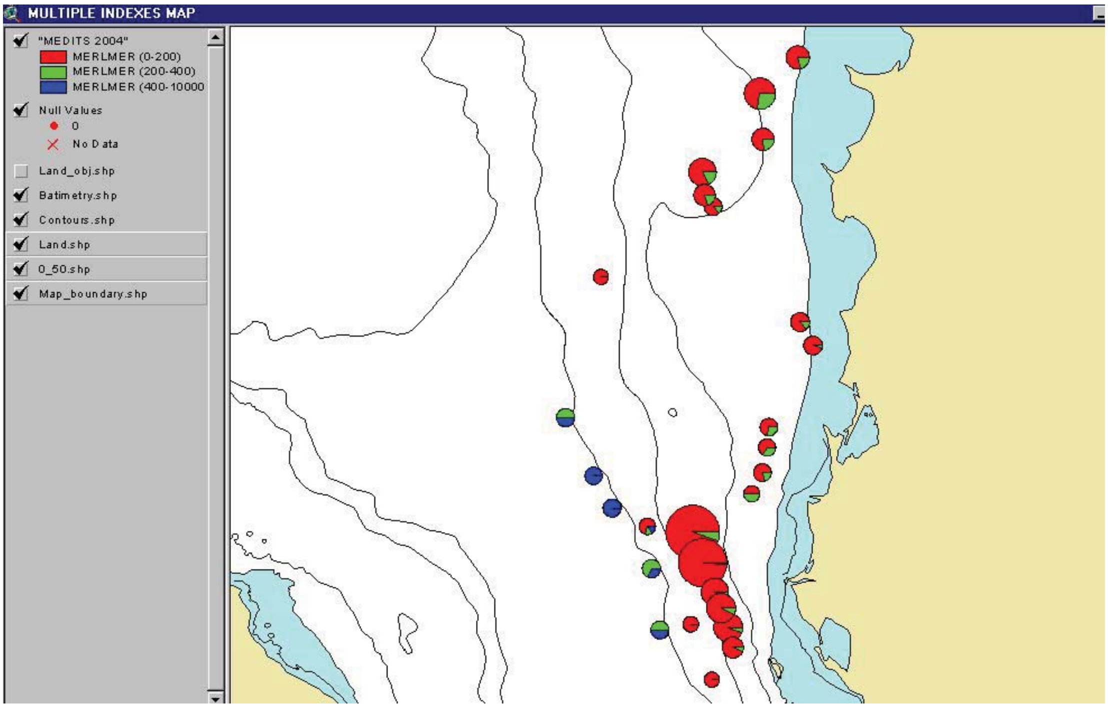


Clicking on MULTIPLEX INDEX ANALYSIS button the following mask will be opened.



1) Select the species to be analysed.
2) Select the minimum and maximum length (if applicable)
3) Select a sex (if applicable)
4) Select the maturity (if applicable)
5) Click on ADD and the species name with the selected characteristics will be displayed in the right box. Repeat the step 1-5 as necessary. Please note that the selection can be repeated for the same species with different characteristics (e. g. *Merluccius merluccius* from 0-200mm, 200-400mm, >400mm).Please note that a maximum of 10 species can be selected.
6) If weight data are not available for the selected species the USE LENGTH WEIGTH RELATIONSHIP option can be checked

7) If the maturity scale used is different for the selected species (e.g. for two surveys a different maturity scale has bee used) check on USE MATURITY SCALE CONVERSION RULES option.
8) Select the type of indexes to be calculated.
9) Clicking on CALCULATE INDEXEX the data will be showed in the mask below.
10) Clicking on MAP INDEXES a map will be generated. The map displays calculated indexes as pie proportional to the total indexes value and divided in % according to the chosen characteristics.

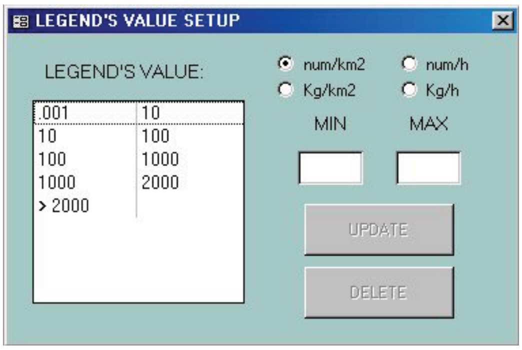


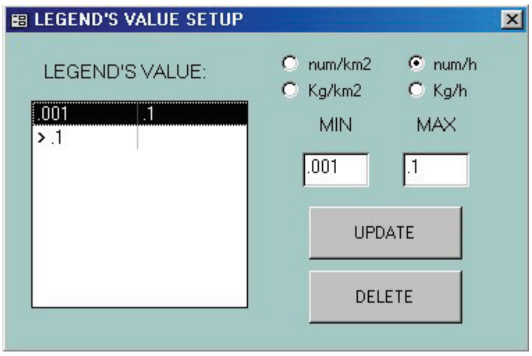
7. 8 Map of Indexes /Set Up Legend

The option to map the data, using the GIS tool, is activated when a species or category is selected. The procedure to map data is the following:

1) Click on SET UP LEGENDS
2) Click on MAP INDEXES

SET UP LEGENDS

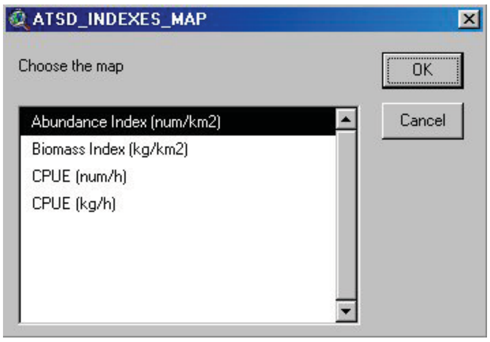




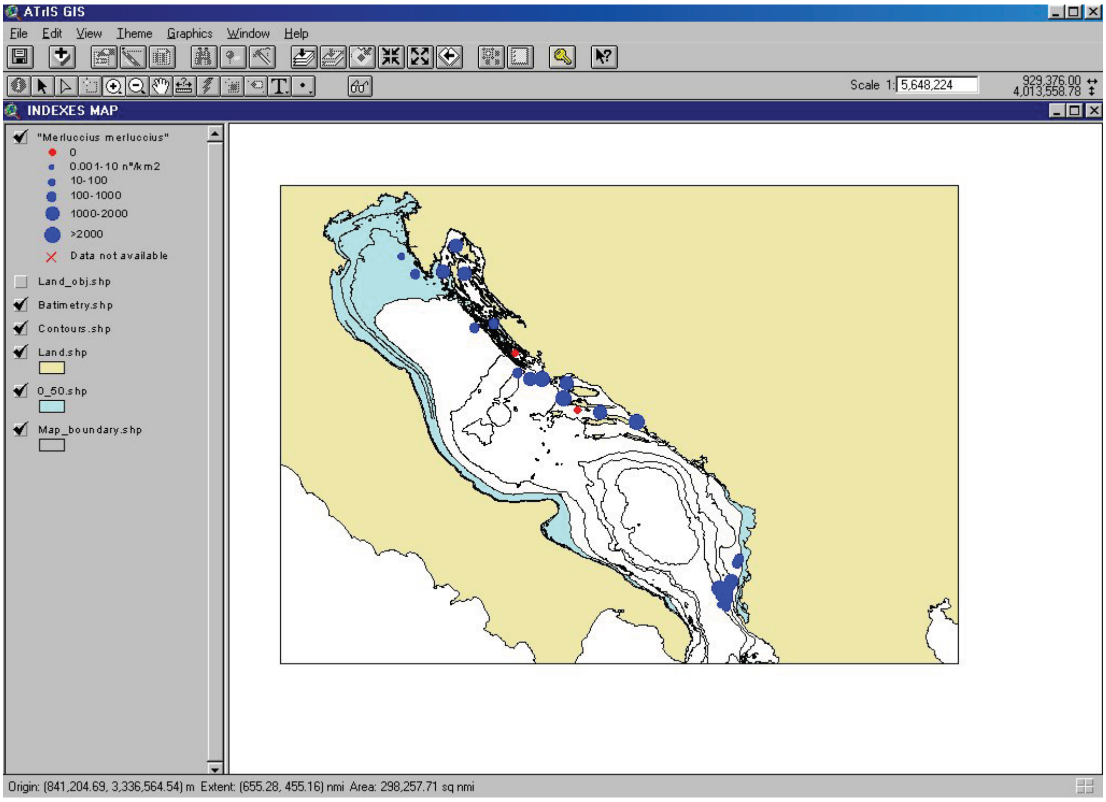
The above window will be opened. For each index fix a range and then click on UPDATE. To modify the interval select the range to be deleted and click on DELETE

MAP INDEXES

Once the legend is configured the button MAP INDEXES can be clicked. A window will be opened: choose the indexes and click on OK.



Automatically ArcView will be opened and the selected data will be visualized on a map (for more details see para 7.8.1).



7.9 Some basic feature of ArcView

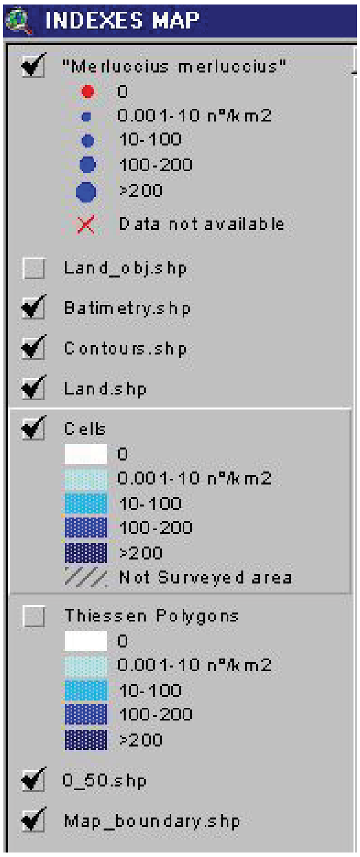
The GIS component of ATrIS has been designed to:
--Support to the data entry procedures when geographic elaboration are needed (e.g. start and end point calculation to estimate the haul length);
--facilitate the data retrieval for a given station (haul) by selecting the station on the map directly (query by location option);
--associate the sampling station to a stratum defined by the user on the basis of the available cartography
--generate thematic map in which to represent the spatial distribution of the calculated indexes
--analyze in a spatial analysis mode the calculated indexes in order to obtain a preliminary estimate of the spatial distribution of a species
--generate reports with the data and the selected area.

These options are available by using a series of buttons and tools added to the Standard Menu and the Tools Bar of ATrIS, and in the ATrIS Menu added to the Standard Menu of ArcView.

Here is a summary of each GIS option.

7.9.1 Read a map: the legend

Some basic features to read a map are given. The map shows the calculated indexes. The legend on the left side explains the symbols and the colors used. Here are some basic tools to view the map.



Species selected
Zero value
Theme legend

Data not available
Color of the land
Color of the bathymetric borders

Cell characteristics

Thiessen polygons characteristics

Bathymetry
Line of boundaries

7.9.2 Useful buttons on ArcView

ZOOM IN and OUT

With the ZOOM IN and ZOOM OUT button  in the toolbar, an area can be enlarged by placing the cursor near the place of interest and dragging it till the area of interest is selected.

PAN

To move the map without modifying it click on the PAN button  and move the cursor to move the map.

GLASSES

The GLASSES button  allows to visualize data corresponding to a certain haul. Click on the GLASSES button and select a particular haul. Automatically the system will display the

Access table with the haul data corresponding to the haul selected. Click on CLOSE and ArcView will be showed again.

ACCESS KEY
The ACCESS KEY button is a shortcut to Access: to go back to ATrIS click on this button and the application on Access will be displayed again.

FULL EXTENT
To go back to the principal theme, after some zooming and panning, click on the FULL EXTENT button or go via menu bar to View/Full Extent and the complete theme will be showed again.

7.9.3 Query by location (glasses)

This option can be used during data entry or data retrieval and it allows the users to select one of the hauls mapped and obtain the corresponding data table. This option is activated when the map point is activated in the table of contents of ArcView (TOC) in the lefts hand side of the screen. To visualize the map just click on the name until the theme appears embossed.

7.9.4 Use GIS tool to define strata

This option has been explained in Chapter 7 para 7.1.4.

7.9.5 Use GIS tool to generate thematic maps

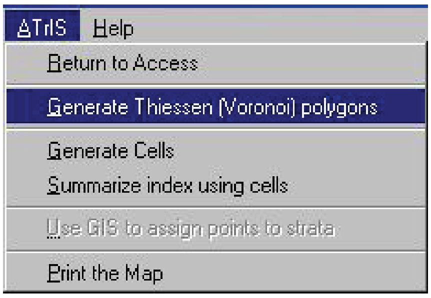
This option allow the user to generate map with the calculated indexes in ATrIS. This option can be used also to map data for more than one survey (see Chapter 6, para 6.3.4.1 for generation of hauls map, para 6.1.1 for generation of map of hauls in a survey; Chapter 7, para 7.1.4 for using GIS tool to define strata and para 7.7 to generate map of multiple indexes).

7.9.6 Calculate the distribution area of a species

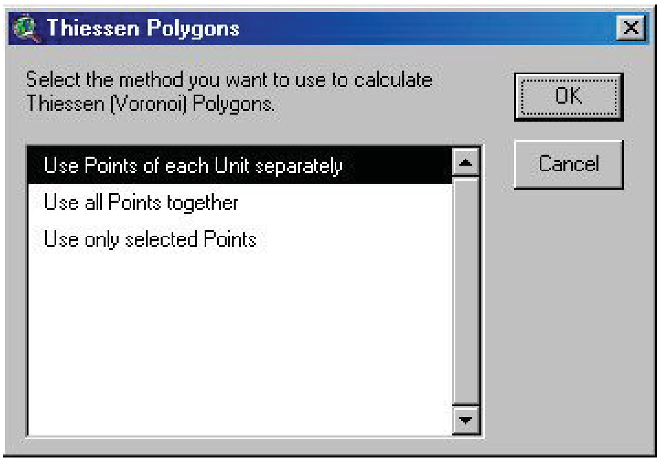
This option is due to two data interpolation techniques in order to estimate the distribution area of a certain species or a population fraction of that species. The techniques are the interpolation method to calculate the Thiessen (Voronoi) polygons and the generation of cells.

7.9.6.1 Generate Thiessen (Voronoi) polygons

This option is included in the ATrIS menu created in ArcView and it is only activated when a thematic map has been generated for an index for a species.

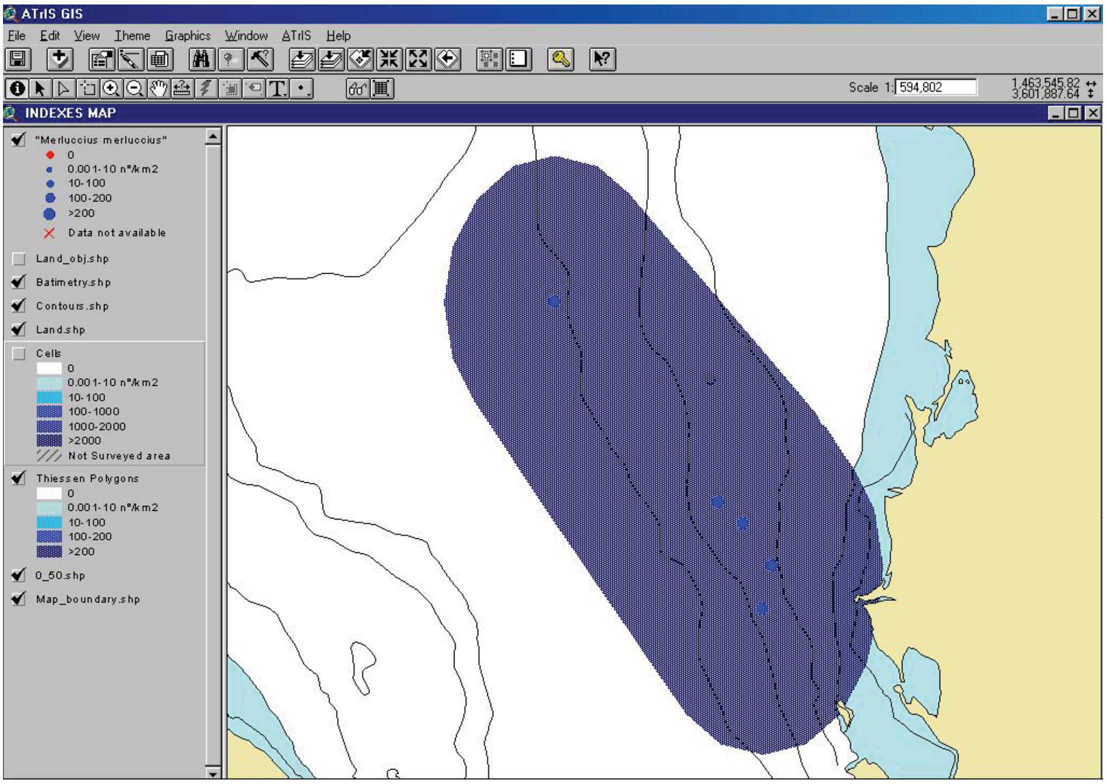


With this technique to each unknown point the value of the nearest known point is associated. With this approximation near a known points several polygons are calculated (the Thiessen polygons) which enclose the nearest space to the known point. To this space the indexes calculated for the known point are associated.
Select the GENERATE THIESSEN (VORONOI) POLYGONS from the ATrIS Menu and a mask will be shown.
The Thiessen polygons are represented with the same scale used to generate the point map (from which the polygon were generated). They may be generated:
-Using each geographical unit separately
-Using all the geographical units together
-Using a series of points selected by the users (>3)



Select the method and ATrIS will generate the corresponding map.

Please use this utility for data of a single survey has been selected. If the utility is used for two or more data surveys the resulted points may generate clusters which make the creation of Thiessen polygons difficult. (See next para for more data surveys)

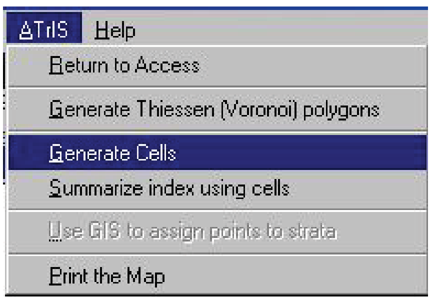


7.9.6.2 Generate cells

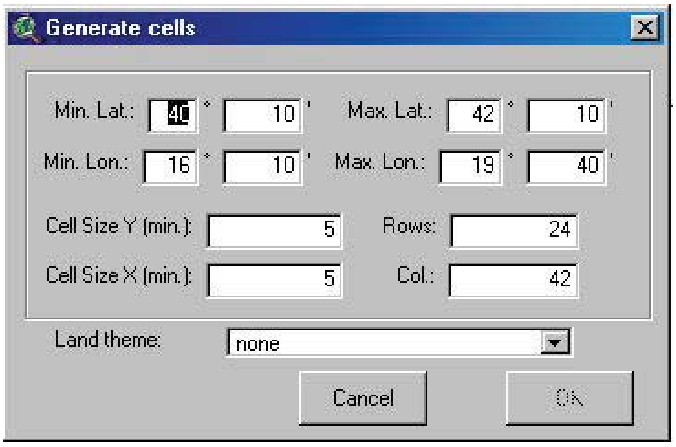
The second option to calculate the distribution area of a species is to divide a selected area in a matrix with n rows/m columns of rectangular elements (cells) whose dimension are determined by the user. The number of points falling in a cell, the minimum, the maximum, the mean value, the variance and the standard deviation value of the index, for each cell, are then calculated. The calculated cells will be represented with the same scale used to represent points estimated with the estimated mean values.

The rectangular elements which form this matrix (cells) and the extension of the matrix could be defined by the users using the option "Generate cells" given in the Menu bar ATrIS, or, alternatively, with the button matrix near the GLASSES button, drawing a rectangular.

--GENERATE CELLS from the ATrIS Menu Bar



A mask will be shown.



The user should define the external borders of the matrix which he/she wishes to generate (Minimum and maximum Latitude, and Minimum and Maximum Longitude)

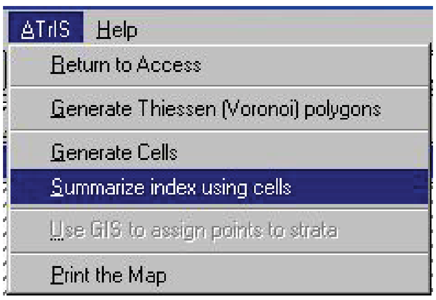
Then the dimension of cell (height and width) expressed in minutes (sixtieth of a degree).

ATrIS will calculate the number of cells for each row and column automatically.

If the cell dimension has been changed, the row and column number will be the same but the maximum longitude and the maximum latitude will be recalculated.

-- GENERATE CELLS from the MATRIX Button
In this case the boundary of the matrix are those defined for the rectangular drawn by the user. 

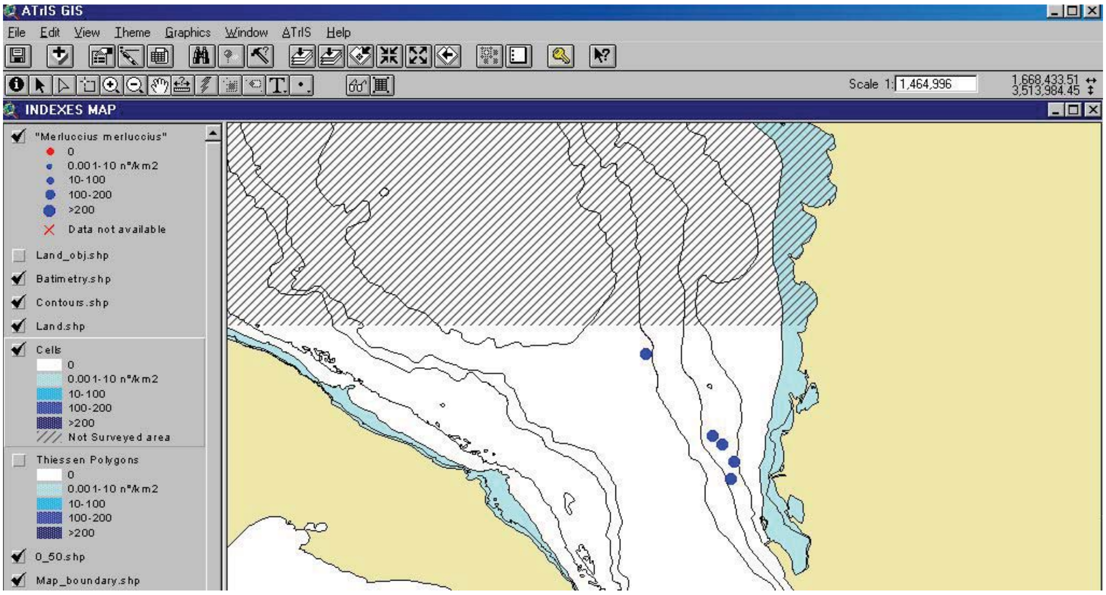
To calculate the indexes for the points which fall in the defined cells select from the ATrIS Menu “SUMMARIZE INDEX USING CELLS”.



The calculation of the minimum, maximum, mean value, variance and standard deviation and the number of the points in the defined area will start.

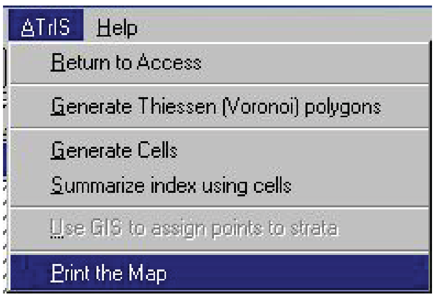
Please use this utility for data of two or more surveys: it encompass the problem of cluster formation and gives a view of the mean values for each cell using all the surveys.

Please also note that the cell generation may be a long operation if cell values higher than 50 rows/column are selected.

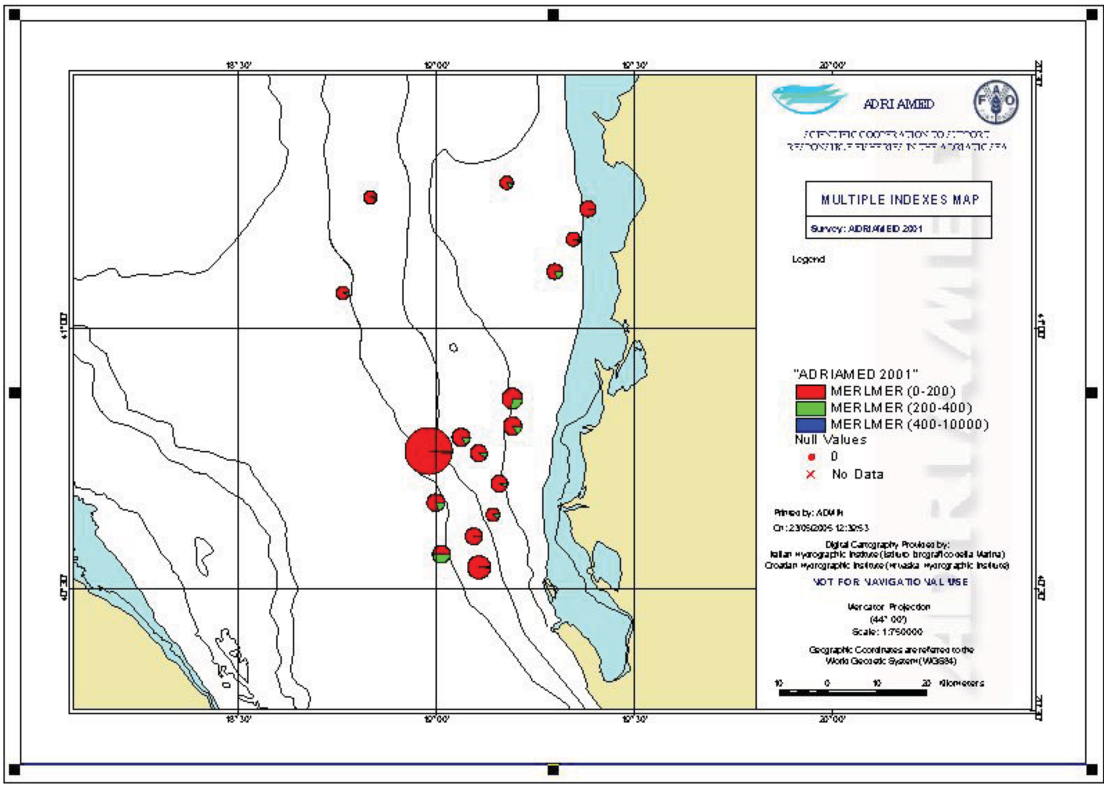


7.9.7 Print reports

The option PRINT THE MAP in the ATrIS menu allow the user to print a report with the map generated in a format with all the data:
A legend of the data
The scale used
The projection used
The cartographic datum
The geographic graticule
The reference to the cartography used

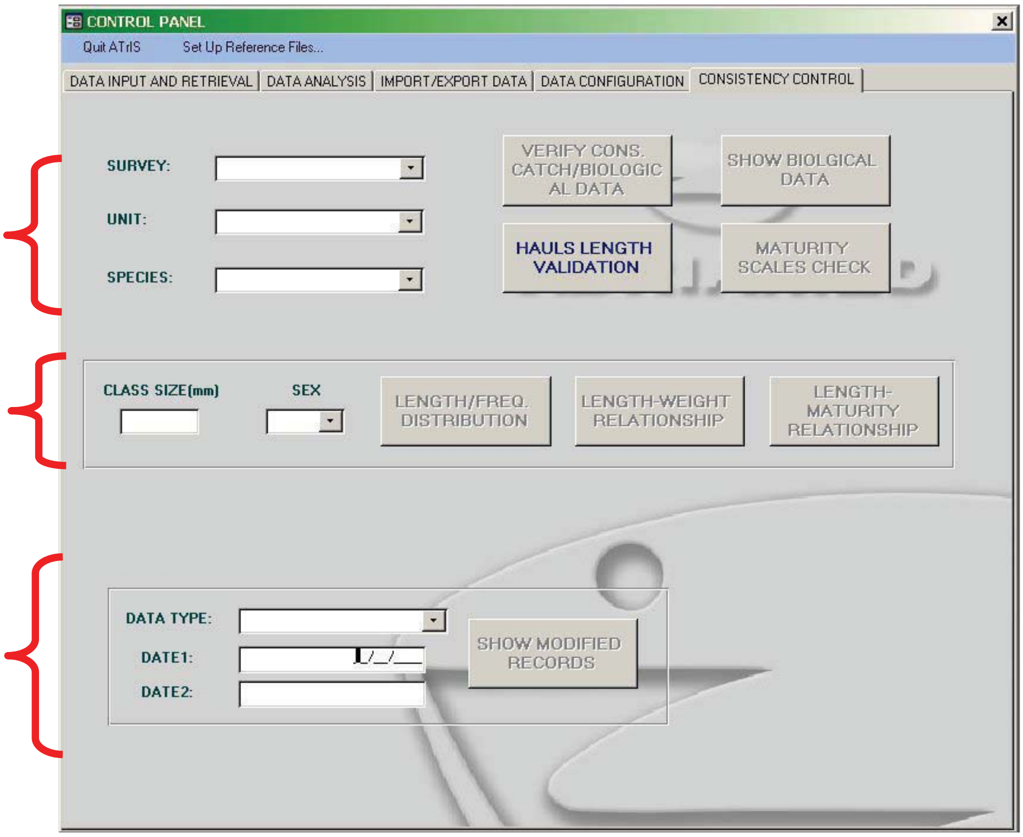


The area represented in the report will be the area zoomed by the user before launch the print option.


ADRIAMED
MULTIPLE INDEXES MAP
Survey: ADRIAMED 2001
Legend
"ADRIAMED 2001"
MERLMER (0-200)
MERLMER (200-400)
MERLMER (400-10000)
Null Values
0
No Data
NOT FOR NAVIGATIONAL USE
Mercator Projection
(44° 00')
Scale: 1:750000
Geographic Coordinates are referred to the World Geodetic System (WGS84)
10 0 10 20 Kilometers

8 Consistency Control

This panel is complementary and supporting all the data validation measures used in the other panels (see chapter 5, 6 and 7). Once the data are inserted the system will check on the consistency of data: it allows to check data *a posteriori* in order to improve data quality. The control can be carried out on a specific survey/unit and it is possible to specify a species. The consistency control, in particular the possibility to show biological data, permits the user to have (print or export) the list of all the specimens with biological data.



Many of the data check controls were developed and are included in the DATA CONFIGURATION panel (see Chapter 5) and help the user to insert data correctly. Data can be further checked for consistency after data entry or if the Administrator has changed some rules, with the options given in the CONSISTENCY CONTROL panel. The following procedures should be carried out to check data:

1) Choose a survey
2) Choose a unit. The button SHOW BIOLOGICAL DATA, MATURITY SCALES CHECK, VERIFY CONSISTENCY CATCH/BIOLOGICAL DATA and HAULS LENGTH VALIDATION will be activated.
3) Select a species (if applicable).
4) Select a class size and/or a sex (if applicable). The buttons LENGTH FREQUENCY DISTRIBUTION, LENGTH WEIGHT RELATIONSHIP and LENGTH MATURITY RELATIONSHIP.

To visualize all the information related to the modification of a record:

1) Select a data type in which perform the query
2) Define the range of date in which limit the search
3) click on SHOW MODIFIED RECORDS

Hereunder the main factors which may have consequences on the error generation are detailed:

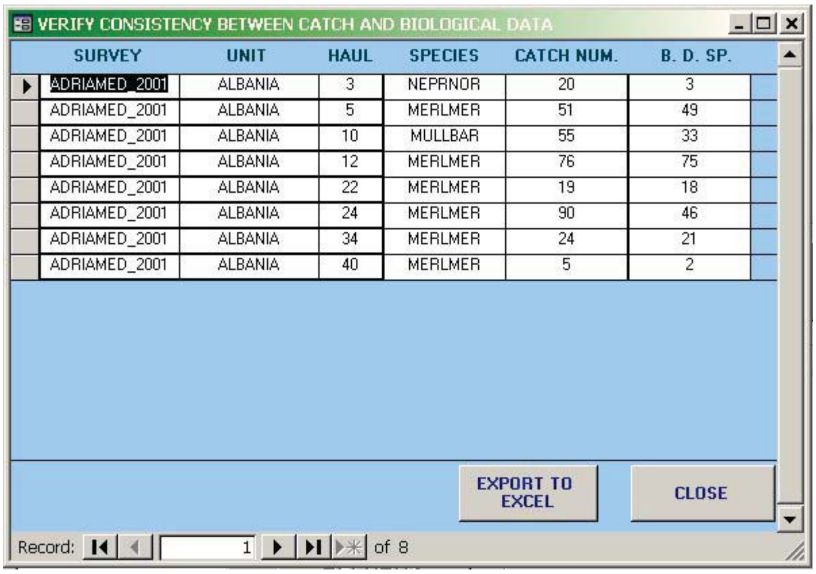
1. Completeness;
2. Consistency;
3. Congruence.

8.1 Completeness

ATrIS provides two options to check data completeness:
--Verification of consistency between catch data and biological data
--List of all the biological data

8.1.1 Verify consistency between catch and biological data

To rapidly verify consistency between catch data and biological data press the button VERIFY CONS.CATCH/BIOLOGIC. DATA. The following mask will be displayed showing for the survey and unit chosen, the list of biological data for each haul. The table can underline the stations in which for a species the number of individuals given in the biological data table does not coincide with the number given in the catch data table. Furthermore, in the case of the target species, this option may underline stations in which there are no biological data available for that species.

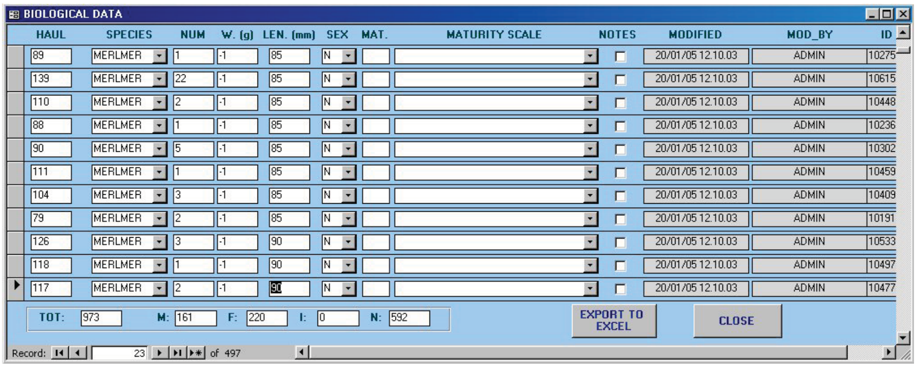


SURVEY	UNIT	HAUL	SPECIES	CATCH NUM.	B. D. SP.
ADRIAMED_2001	ALBANIA	3	NEPRNOR	20	3
ADRIAMED_2001	ALBANIA	5	MERLMER	51	49
ADRIAMED_2001	ALBANIA	10	MULLBAR	55	33
ADRIAMED_2001	ALBANIA	12	MERLMER	76	75
ADRIAMED_2001	ALBANIA	22	MERLMER	19	18
ADRIAMED_2001	ALBANIA	24	MERLMER	90	46
ADRIAMED_2001	ALBANIA	34	MERLMER	24	21
ADRIAMED_2001	ALBANIA	40	MERLMER	5	2

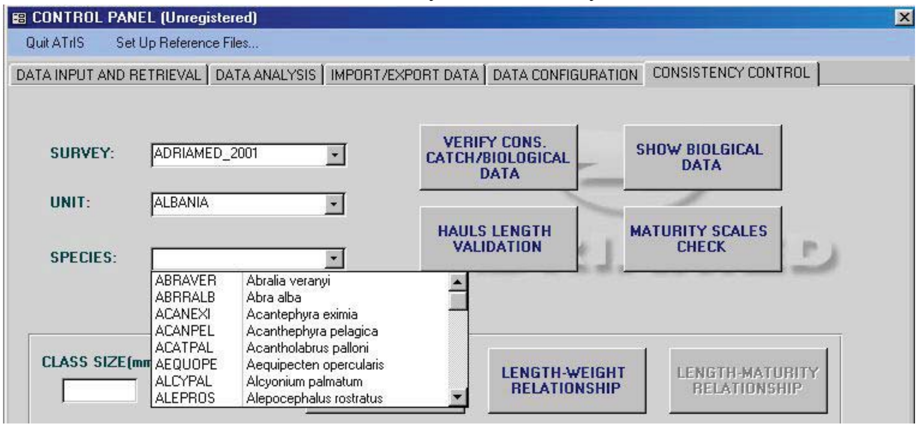
8.1.2 Show biological data

Attraverso la seconda funzionalità è possibile consultare tutte le informazioni inserite nella tabella relativa ai dati biologici, e di conseguenza verificare quali specie sono state inserite e quali invece sono ancora mancanti. E' possibile effettuare il controllo specie per specie selezionando una specie nell'apposita casella combinata (Combobox "Species").

This button shows all the biological data included for the survey and unit selected. This option allows the users to check which species are inserted and which are missing.



For a single species select for a species name in the combo box SPECIES. Please note that the data visualized cannot be modified, they are read only.



8.2 Consistency

This option has been developed to guarantee the logical consistency of data. This can be achieved when:
--inserted data follow the rules given by the Administrator
--data are significant for the described phenomenon.

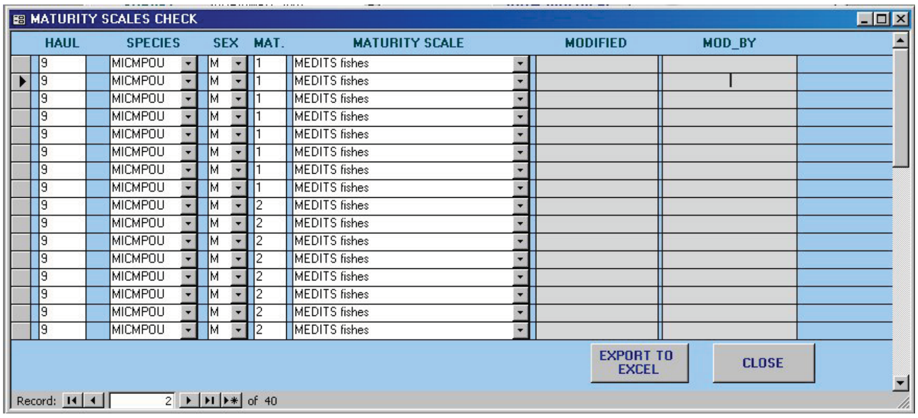
8.2.1 Maturity scales check

To check if the inserted data follow the rules given by the Administrator the option MATURITY SCALES CHECK can be used. In this case the data should follow the rules given by a certain maturity scale and the maximum value indicated by the same scale.

--Select a species

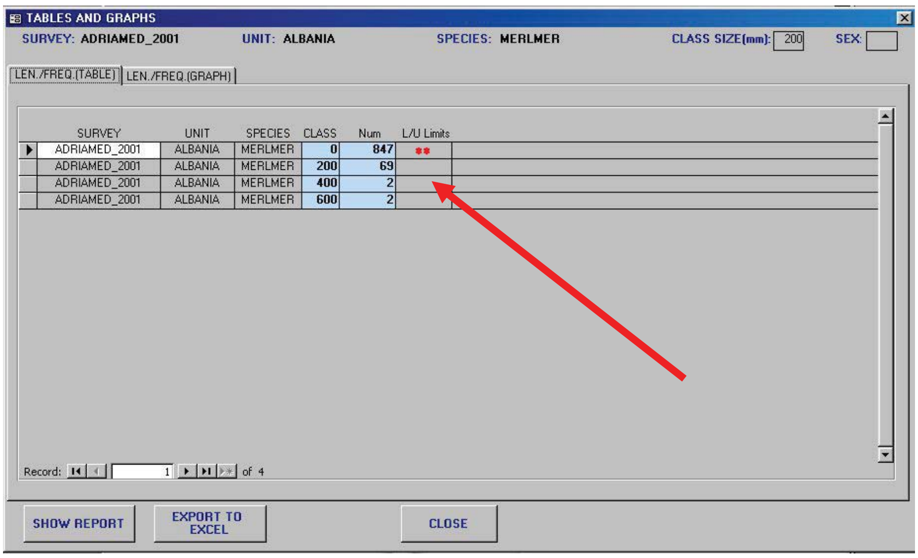
--Click on MATURITY SCALES CHECK

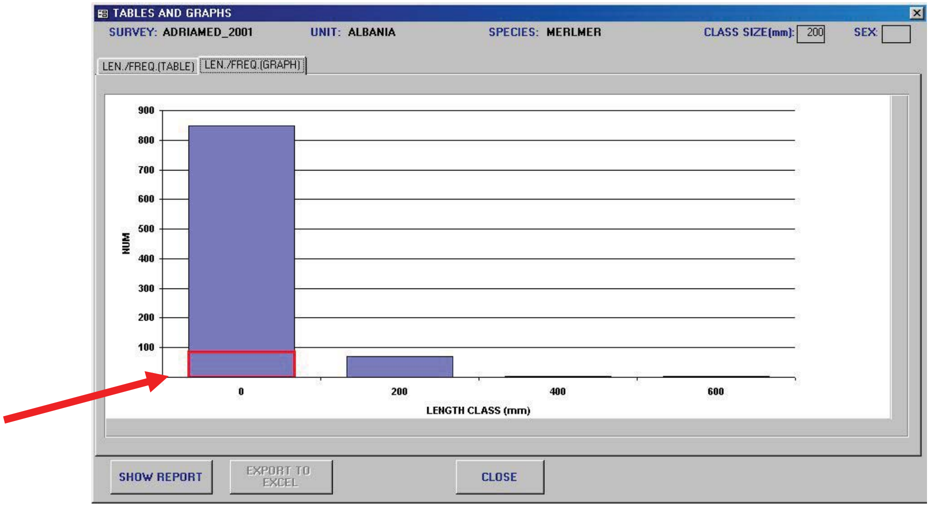
--The list of all the specimens for the species selected will be given.



8.2.2 Length frequency distribution

When choosing a class size or a sex the control can be refined on the species selected. The LENGTH FREQUENCY DISTRIBUTION button displays the data in a length frequency table and a length frequency graph. The table shows the number of individuals included in a given length class and the value of the length interval set during data configuration (see Chapter 4). In particular the chart facilitates the visualization of specimens in anomalous length classes.





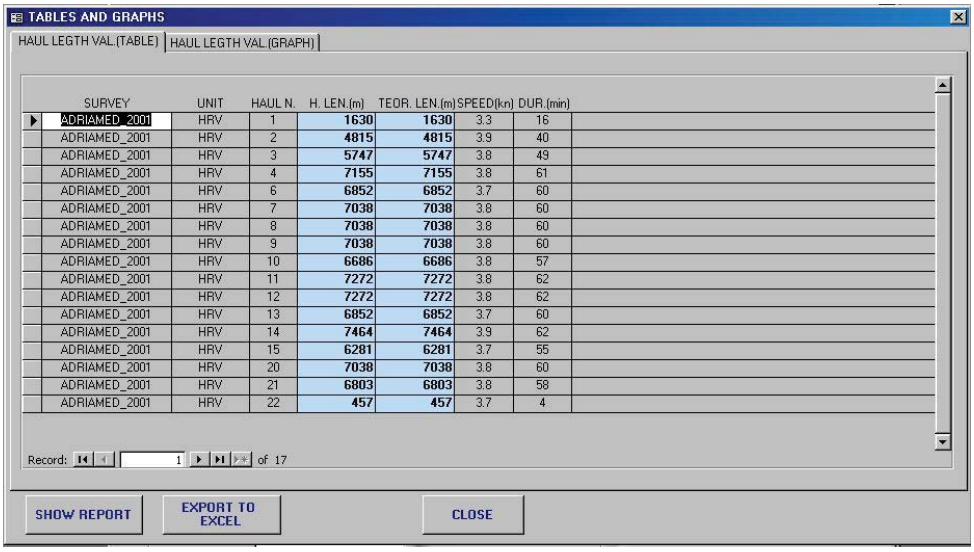
In particular the chart facilitates the visualization of specimens in anomalous length classes.

8.3 Congruence

To estimate the congruence two options have been developed in ATrIS:
--Hauls Length Validation
--Length Weight Relationships

8.3.1 Hauls length validation

Data on haul length is important in the estimation of indexes. Haul length validation is carried out comparing the haul length recorded with the theoretical haul length estimated as the time of haul duration multiplied the mean speed (SAMED Project, see also Chapter 6, para 6.3.4.3). If click on HAULS LENGTH VALIDATION button the following table will be shown. A summary of the information on the haul is given, showing the Haul Length calculated (H.LEN (m)), the theoretic length (TEOR.LEN(m)), the speed (SPEED (Km)) and the duration (DUR.(min)).

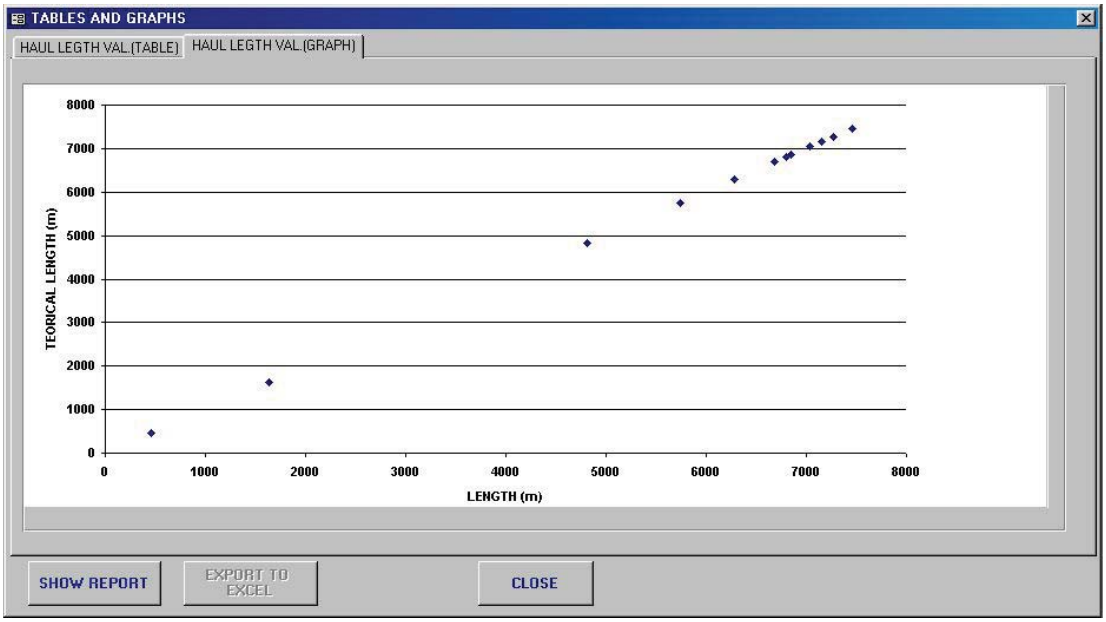

TABLES AND GRAPHS

HAUL LEGTH VAL.(TABLE) | HAUL LEGTH VAL.(GRAPH)

SURVEY	UNIT	HAUL N.	H. LEN.(m)	TEOR. LEN.(m)	SPEED(kn)	DUR.(min)
ADRIAMED_2001	HRV	1	1630	1630	3.3	16
ADRIAMED_2001	HRV	2	4815	4815	3.9	40
ADRIAMED_2001	HRV	3	5747	5747	3.8	49
ADRIAMED_2001	HRV	4	7155	7155	3.8	61
ADRIAMED_2001	HRV	6	6852	6852	3.7	60
ADRIAMED_2001	HRV	7	7038	7038	3.8	60
ADRIAMED_2001	HRV	8	7038	7038	3.8	60
ADRIAMED_2001	HRV	9	7038	7038	3.8	60
ADRIAMED_2001	HRV	10	6686	6686	3.8	57
ADRIAMED_2001	HRV	11	7272	7272	3.8	62
ADRIAMED_2001	HRV	12	7272	7272	3.8	62
ADRIAMED_2001	HRV	13	6852	6852	3.7	60
ADRIAMED_2001	HRV	14	7464	7464	3.9	62
ADRIAMED_2001	HRV	15	6281	6281	3.7	55
ADRIAMED_2001	HRV	20	7038	7038	3.8	60
ADRIAMED_2001	HRV	21	6803	6803	3.8	58
ADRIAMED_2001	HRV	22	457	457	3.7	4

Record: 1 of 17

SHOW REPORT | EXPORT TO EXCEL | CLOSE



The points should appear near the bisector of the first quadrant. The point position will coincide with the bisector just when the haul length recorded was calculated using the Speed and Duration method. When the position of a point is distant from the bisector the following elements should be analyzed if the haul length was calculated using the "Start point and end point algorithm" (see Chapter 6, para 6.3.4.3)

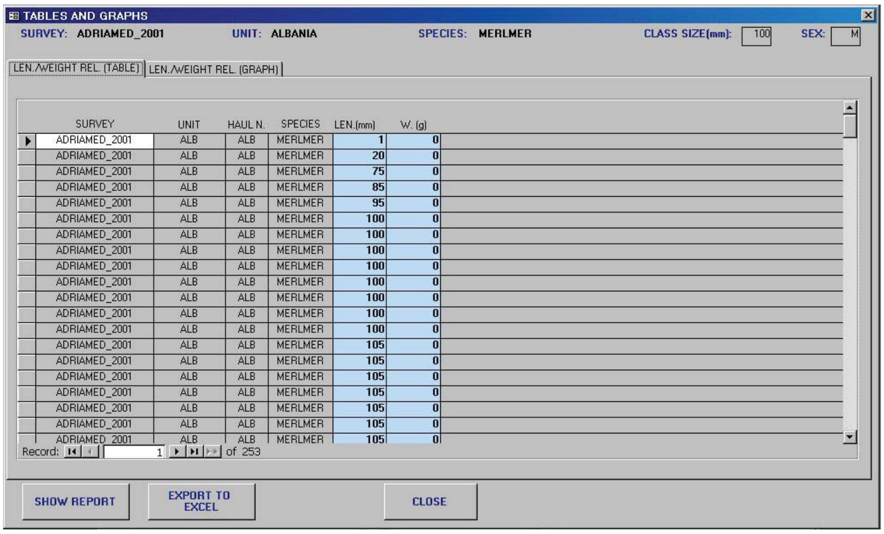
--if the haul length recorded is lower than the theoretical haul length, maybe the haul was not linear: in this case, probably the theoretical haul length value is more exact than the recorded one.

-- if the haul length recorded is higher than the theoretical haul length, it should be checked if the speed during the haul has been regular and the start time and end time were registered in a correct way.

In any case the user should evaluate case by case when the haul length recorded is not similar to the theoretical value.

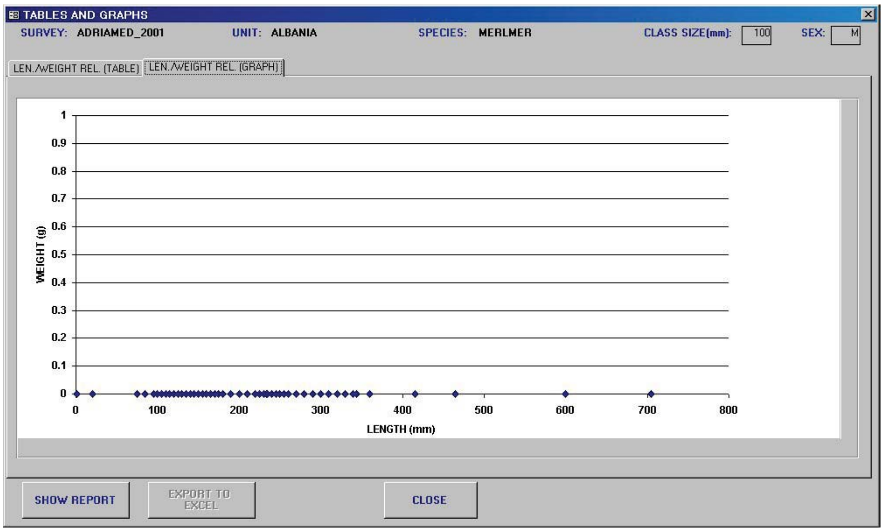
8.3.2 Length weight relationship

With this option a table summarizing the length-weight data for each individual or group of individuals is generated.



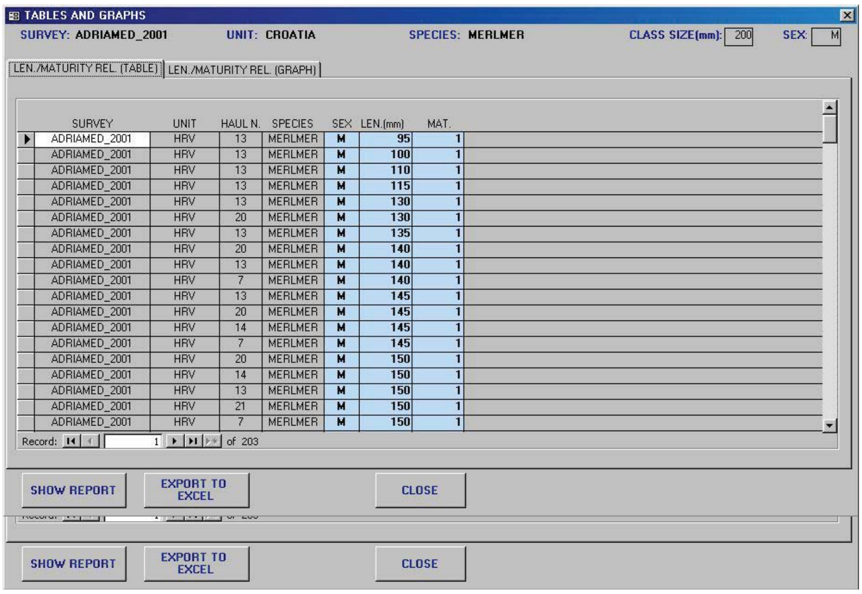
SURVEY	UNIT	HAUL N.	SPECIES	LEN.(mm)	W. (g)
ADRIAMED_2001	ALB	ALB	MERLMER	1	0
ADRIAMED_2001	ALB	ALB	MERLMER	20	0
ADRIAMED_2001	ALB	ALB	MERLMER	75	0
ADRIAMED_2001	ALB	ALB	MERLMER	85	0
ADRIAMED_2001	ALB	ALB	MERLMER	95	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	100	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0
ADRIAMED_2001	ALB	ALB	MERLMER	105	0

If weight data are not included the value charted is equal to 0. This option allows the users to check for individuals with length-weight data which diverge with the length-weight relationships given for that species in the literature.

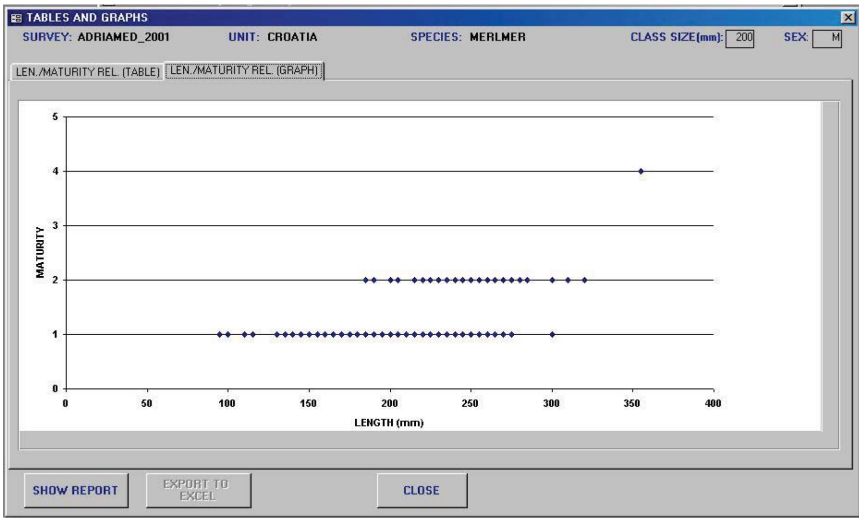


8.3.3 Length/Sexual maturity relationships

Clicking on LENGTH/MATURITY RELATIONSIPS a table is generated with the data on sex, length and maturity stages for each individual. The graph is also useful, for example, to identify individuals with length lower than the length at fist maturity related with maturity stages not congruent with it.

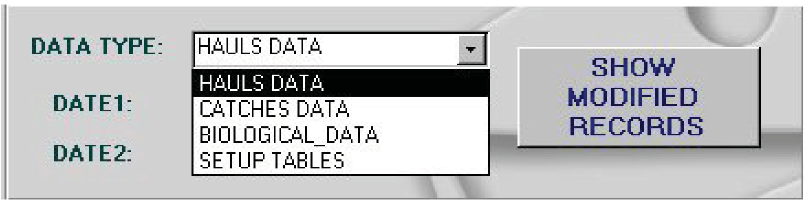


SURVEY	UNIT	HAUL N.	SPECIES	SEX	LEN.(mm)	MAT.
ADRIAMED_2001	HRV	13	MERLMER	M	95	1
ADRIAMED_2001	HRV	13	MERLMER	M	100	1
ADRIAMED_2001	HRV	13	MERLMER	M	110	1
ADRIAMED_2001	HRV	13	MERLMER	M	115	1
ADRIAMED_2001	HRV	13	MERLMER	M	130	1
ADRIAMED_2001	HRV	20	MERLMER	M	130	1
ADRIAMED_2001	HRV	13	MERLMER	M	135	1
ADRIAMED_2001	HRV	20	MERLMER	M	140	1
ADRIAMED_2001	HRV	13	MERLMER	M	140	1
ADRIAMED_2001	HRV	7	MERLMER	M	140	1
ADRIAMED_2001	HRV	13	MERLMER	M	145	1
ADRIAMED_2001	HRV	20	MERLMER	M	145	1
ADRIAMED_2001	HRV	14	MERLMER	M	145	1
ADRIAMED_2001	HRV	7	MERLMER	M	145	1
ADRIAMED_2001	HRV	20	MERLMER	M	150	1
ADRIAMED_2001	HRV	14	MERLMER	M	150	1
ADRIAMED_2001	HRV	13	MERLMER	M	150	1
ADRIAMED_2001	HRV	21	MERLMER	M	150	1
ADRIAMED_2001	HRV	7	MERLMER	M	150	1



8.4 Account management

One powerful tool of the ATrIS Consistency control is the account management with the possibility to archive all the modifications performed in the system, the person responsible for the modification and the date of the modification.



If click on the button SHOW MODIFIED RECORDS a list of all the modification will be generated.

sk_MODIFIED_RECS_HAULS : Form

SURVEY	COUNTRY	HAUL	MODIFIED ON	MODIFIED BY	REC. ID
ADRIAMED_2001	ALB	3	07/02/05 13.18.36	ADMINNICO	1
ADRIAMED_2004	SLO	1	24/01/05 18.29.50	ADMIN	194
ADRIAMED_2004	SLO	2	24/01/05 18.29.47	ADMIN	195
MEDITS_2004	ALB	1	19/01/05 16.12.32	ADMIN	344
MEDITS_2004	ALB	2	19/01/05 16.12.32	ADMIN	345
MEDITS_2004	ALB	4	19/01/05 16.12.32	ADMIN	346
MEDITS_2004	ALB	6	19/01/05 16.12.32	ADMIN	347
MEDITS_2004	ALB	7	19/01/05 16.12.32	ADMIN	348
MEDITS_2004	ALB	8	19/01/05 16.12.32	ADMIN	349
MEDITS_2004	ALB	10	19/01/05 16.12.32	ADMIN	350
MEDITS_2004	ALB	11	19/01/05 16.12.32	ADMIN	351
MEDITS_2004	ALB	12	19/01/05 16.12.32	ADMIN	352
MEDITS_2004	ALB	13	19/01/05 16.12.32	ADMIN	353
MEDITS_2004	ALB	14	19/01/05 16.12.32	ADMIN	354
MEDITS_2004	ALB	15	19/01/05 16.12.32	ADMIN	355
MEDITS_2004	ALB	16	19/01/05 16.12.32	ADMIN	356
MEDITS_2004	ALB	17	19/01/05 16.12.32	ADMIN	357
MEDITS_2004	ALB	19	19/01/05 16.12.32	ADMIN	358
MEDITS_2004	ALB	21	19/01/05 16.12.32	ADMIN	359
MEDITS_2004	ALB	22	19/01/05 16.12.32	ADMIN	360
MEDITS_2004	ALB	23	19/01/05 16.12.32	ADMIN	361
MEDITS_2004	ALB	24	19/01/05 16.12.32	ADMIN	362
MEDITS_2004	ALB	25	19/01/05 16.12.32	ADMIN	363
MEDITS_2004	ALB	26	19/01/05 16.12.32	ADMIN	364
MEDITS_2004	ALB	27	19/01/05 16.12.32	ADMIN	365

Record: 1 of 93

This kind of information together with the date is always printed on the report generated by ATrIS. In this way it is possible to check the data bank modification and to verify the congruence between a modification and the databank up-date status.

9. References

AdriaMed. 2000. Priority Topics Related to Shared Demersal Fishery Resources of the Adriatic Sea. Report of the First Meeting of the AdriaMed Working Group on Shared Demersal Resources. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD-02: 21 pp.

AdriaMed. 2001. Report of the Second Meeting of the AdriaMed Coordination Committee. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD-04. *AdriaMed Technical Documents,* 4: 41 pp.

AdriaMed. 2003. Report of the Fourth Meeting of the AdriaMed Coordination Committee. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD-09. *AdriaMed Technical Documents, 9:* 39 pp.

Anonymous. (1998) Campagne internationale de chalutage démersal en Méditerraneé (MEDITS) : manuel des protocoles. *Biol. Mar. Medit*., 5(2): 515-572.

Bertrand, J. (1995) Campagnes internationales de chalutage démersal en Méditerraneé (MEDITS) Campagne 1994. Manuel des protocoles. Rapp de Contract EC-IFREMER-IEO-SIBM-NCMR (MED 93:020 018 006004). 27 pp.

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Annex A --Report formats

The following are representations of the reports that can be generated from ATRIS.

ADRIAMED

SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

SURVEY	UNIT	HAUL	DATE
ADRIAMED 2001	ALBANIA	34	06/11/2001

MERLMER *(Merluccius merluccius)*

N. SPEC.	LEN.(mm)	W. (g)	SEX	MAT.	MAT. SCALE	INSERT BY	ON
1	200	-1	M	1	MEDITS fishes NOTE:		
1	220	-1	M	1	MEDITS fishes NOTE:	ADMIN	05/04/2005 22.07.33
1	234	-1	F	3	MEDITS fishes NOTE:	ADMIN	29/11/2004 21.35.13
1	115	-1	I		NOTE: PROVA BIOLOGICO ID 9222	ADMIN	05/04/2005 22.07.38
1	120	-1	I		NOTE:		
5	125	-1	I		NOTE:	ADMIN	29/11/2004 23.08.42
4	135	-1	I		NOTE:		
4	140	-1	I		NOTE:		
1	344	-1	I		NOTE:	ADMIN	29/11/2004 21.36.15
2	130	-1	N		NOTE:	ADMIN	29/11/2004 21.36.37

N. TOT.	21	M	2	F	1	I	16	N	2

NEPRNOR *(Nephrops norvegicus)*

N. SPEC.	LEN.(mm)	W. (g)	SEX	MAT.	MAT. SCALE	INSERT BY	ON
1	12	-1	M		NOTE:	ADMIN	06/04/2005 19.23.17
1	14	-1	M		NOTE:	ADMIN	06/04/2005 19.24.05
3	20	-1	F	3	MEDITS Nephrops female NOTE:	ADMIN	09/05/2005 11.29.34
1	13	-1	N		NOTE:	ADMIN	09/05/2005 11.29.18

N. TOT.	6	M	2	F	3	I	0	N	1

ADRIAMED

SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

SURVEY: ADRIAMED_2002 **UNIT:** CROATIA
SELECTED STRATA:
21116, 21117, 21118, 21119

NUMBER	HAULS AVAIL.:	9	TOT. NUM.:	9
	TOT. SURFACE (km2):	31727		
WEIGHT	HAULS AVAIL.:	9	TOT. NUM.:	9
	TOT. SURFACE (km2):	31727		

SELECTION PARAMETERS LEN. INT.: CLASS SIZE: SEX: MAT.: L/W REL: MAT. SCALE CONV.:

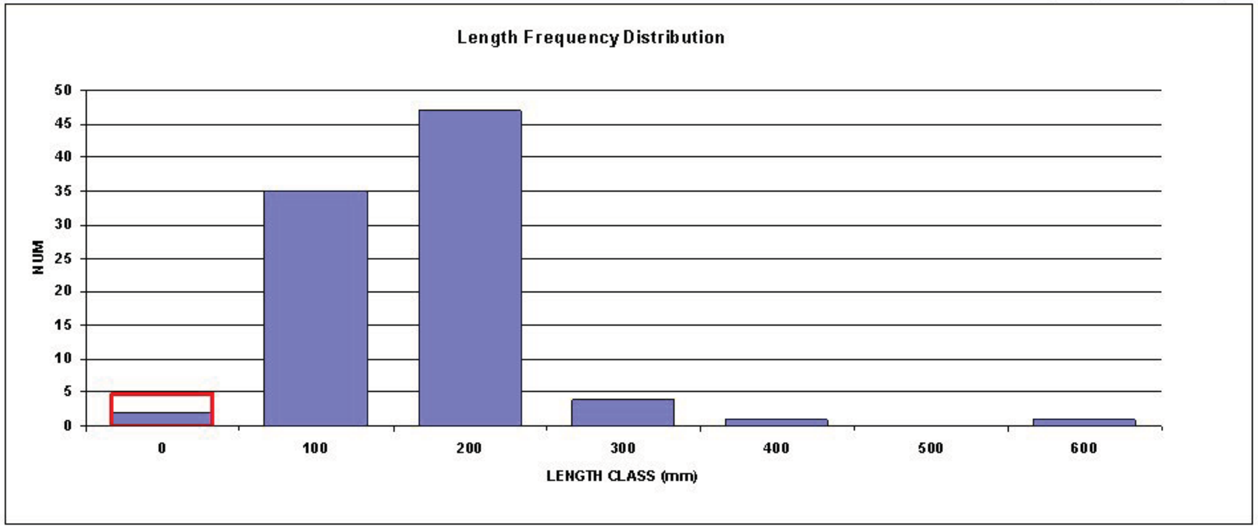
SURVEY	SPECIES	DEPTH(m) MIN	MAX	N/Km2	ST.DEV.-C.V.	N/h	ST.DEV.-C.V.	DEPTH(m) MIN	MAX	Kg/Km2	ST.DEV.-C.V.	Kg/h	ST.DEV.-C.V.
ADRIAMED_2002	LOPHBUD	10	500	14.19	4.09 - 28.80	1.00	0.29 - 29.31	10	500	6.87	4.88 - 70.98	.49	0.35 - 72.01
ADRIAMED_2002	GOBINIG	10	500	721.66	643.02 - 89.10	50.80	45.25 - 89.09	10	500	10.21	9.00 - 88.11	.72	0.63 - 88.09
ADRIAMED_2002	GOBIQUA	10	500	52.75	36.42 - 69.04	3.74	2.62 - 70.05	10	500	.41	0.21 - 52.13	.03	0.02 - 52.74
ADRIAMED_2002	HELIDAC	10	500	30.27	0.00 - 0.00	2.13	0.00 - 0.00	10	500	.28	0.00 - 0.00	.02	0.00 - 0.00
ADRIAMED_2002	ILLECOI	10	500	249.85	95.93 - 38.39	17.67	6.76 - 38.25	10	500	13.08	2.61 - 19.95	.92	0.18 - 19.99
ADRIAMED_2002	LEPICAU	10	500	82.46	0.00 - 0.00	5.80	0.00 - 0.00	10	500	18.03	0.00 - 0.00	1.27	0.00 - 0.00
ADRIAMED_2002	LEPMBOS	10	500	16.70	0.00 - 0.00	1.18	0.00 - 0.00	10	500	.69	0.00 - 0.00	.05	0.00 - 0.00
ADRIAMED_2002	LEPMWHS	10	500	19.84	0.00 - 0.00	1.40	0.00 - 0.00	10	500	1.31	0.00 - 0.00	.09	0.00 - 0.00
ADRIAMED_2002	PAGEACA	10	500	3.92	1.69 - 42.99	.28	0.12 - 42.99	10	500	.17	0.07 - 40.31	.01	0.00 - 40.31
ADRIAMED_2002	LOLIVUL	10	500	140.32	60.05 - 42.79	9.90	4.22 - 42.59	10	500	13.30	4.49 - 33.79	.94	0.32 - 33.62
ADRIAMED_2002	GADIARG	10	500	50.11	0.00 - 0.00	3.53	0.00 - 0.00	10	500	.21	0.00 - 0.00	.01	0.00 - 0.00
ADRIAMED_2002	MACOSCO	10	500	5.22	0.00 - 0.00	.37	0.00 - 0.00	10	500	.04	0.00 - 0.00	.00	0.00 - 0.00
ADRIAMED_2002	MAJASQU	10	500	6.87	4.88 - 71.04	.48	0.34 - 70.89	10	500	4.79	3.64 - 75.99	.34	0.26 - 75.85
ADRIAMED_2002	MERLMER	10	500	2064.97	465.20 - 22.53	145.84	33.61 - 23.04	10	500	139.80	36.63 - 26.20	9.87	2.64 - 26.72
ADRIAMED_2002	MICMPOU	10	500	21.92	0.00 - 0.00	1.54	0.00 - 0.00	10	500	2.44	0.00 - 0.00	.17	0.00 - 0.00
ADRIAMED_2002	MULLBAR	10	500	1156.90	547.05 - 47.29	81.76	38.33 - 46.88	10	500	41.30	20.15 - 48.79	2.92	1.41 - 48.24
ADRIAMED_2002	MULLSUR	10	500	11.04	7.54 - 68.24	.78	0.53 - 67.62	10	500	.84	0.40 - 47.56	.06	0.03 - 47.32
ADRIAMED_2002	MUSTMUS	10	500	8.47	5.43 - 64.10	.60	0.38 - 63.96	10	500	12.70	8.14 - 64.10	.90	0.57 - 63.96
ADRIAMED_2002	ABRAVER	10	500	126.81	55.56 - 43.81	8.97	3.91 - 43.63	10	500	9.36	8.02 - 85.73	.66	0.56 - 85.71
ADRIAMED_2002	LEPTCAV	10	500	1512.78	866.60 - 57.29	106.66	61.03 - 57.22	10	500	31.11	22.22 - 71.44	2.19	1.56 - 71.38
ADRIAMED_2002	DENTGIB	10	500	119.30	109.65 - 91.91	8.40	7.72 - 91.91	10	500	11.01	10.12 - 91.91	.77	0.71 - 91.91

20/05/2005 10.03.27 ADMIN Pagina 1 di 4

ADRIAMED

SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

SURVEY: ADRIAMED_2001 **UNIT:** ALBANIA **SPECIES:** MERLMER **CLASS SIZE (mm):** 100 **SEX:** M



ADRIAMED

SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

SURVEY: ADRIAMED_2002 UNIT: CROATIA

SELECTED STRATA (HAULS DEPTH):
01, 02, 03, 04, 05, 06

NUMBER	HAULS AVAIL.: 19	TOT. NUM.: 19	TOT. SURFACE (km2):	100700
WEIGHT	HAULS AVAIL.: 19	TOT. NUM.: 19	TOT. SURFACE (km2):	100700

SELECTION PARAMETERS LEN. INT.: CLASS SIZE: SEX: MAT.: LAW REL: MAT. SCALE CONV.:

SURVEY	SPECIES	DEPTH(m) MIN	DEPTH(m) MAX	N/Km2	ST.DEV.-C.V.	N/h	ST.DEV.-C.V.	DEPTH(m) MIN	DEPTH(m) MAX	Kg/Km2	ST.DEV.-C.V.	Kg/h	ST.DEV.-C.V.
ADRIAMED_2002	SP.AGG	10	200	61824.94	42.84 - 0.07	4348.27	2.20 - 0.05	10	200	2948.38	0.42 - 0.01	207.44	0.02 - 0.01

SPECIES LIST USED AS ONE SPECIES:

MEDITS CODE	SCIENTIFIC NAME
ABRAVER	Abralia veranyi
MERLMER	Merluccius merluccius
MULLBAR	Mullus barbatus
NEPRNOR	Nephrops norvegicus

20/05/2005 10.16.42 ADMIN Pagina 1 di 2

HAULS LENGTH VALIDATION

SURVEY	UNIT	HAUL N.	H. LEN.(m)	TEOR. LEN.(m)	SPEED (kn).	DUR. (min)
ADRIAMED_2001	ALB	3	5100	5186	2.8	60
ADRIAMED_2001	ALB	5	6355	4630	2.5	60
ADRIAMED_2001	ALB	7	5564	5000	2.7	60
ADRIAMED_2001	ALB	8	5095	4445	2.4	60
ADRIAMED_2001	ALB	10	5050	4753	2.8	55
ADRIAMED_2001	ALB	12	5000	5000	2.7	60
ADRIAMED_2001	ALB	14	4500	4630	2.5	60
ADRIAMED_2001	ALB	16	4500	4815	2.6	60
ADRIAMED_2001	ALB	18	3800	3750	2.7	45
ADRIAMED_2001	ALB	22	5100	5186	2.8	60
ADRIAMED_2001	ALB	24	1505153	4630	2.5	60
ADRIAMED_2001	ALB	27	4000	4445	2.4	60
ADRIAMED_2001	ALB	30	4500	4630	2.5	60
ADRIAMED_2001	ALB	31	4750	4815	2.6	60
ADRIAMED_2001	ALB	32	4915	4815	2.6	60
ADRIAMED_2001	ALB	34	5000	5000	2.7	60
ADRIAMED_2001	ALB	37	5100	5186	2.8	60
ADRIAMED_2001	ALB	40	4500	4630	2.5	60
ADRIAMED_2001	HRV	1	1630	1630	3.3	16
ADRIAMED_2001	HRV	2	4815	4815	3.9	40
ADRIAMED_2001	HRV	3	5747	5747	3.8	49
ADRIAMED_2001	HRV	4	7155	7155	3.8	61
ADRIAMED_2001	HRV	6	6852	6852	3.7	60
ADRIAMED_2001	HRV	7	7038	7038	3.8	60
ADRIAMED_2001	HRV	8	7038	7038	3.8	60
ADRIAMED_2001	HRV	9	7038	7038	3.8	60
ADRIAMED_2001	HRV	10	6686	6686	3.8	57
ADRIAMED_2001	HRV	11	7272	7272	3.8	62
ADRIAMED_2001	HRV	12	7272	7272	3.8	62
ADRIAMED_2001	HRV	13	6852	6852	3.7	60
ADRIAMED_2001	HRV	14	7464	7464	3.9	62
ADRIAMED_2001	HRV	15	6281	6281	3.7	55
ADRIAMED_2001	HRV	20	7038	7038	3.8	60
ADRIAMED_2001	HRV	21	6803	6803	3.8	58
ADRIAMED_2001	HRV	22	457	457	3.7	4
ADRIAMED_2001	SLO	1	0	0	3.5	1440
ADRIAMED_2001	SLO	2	0	0	3.5	1440

ADRIAMED
SCIENTIFIC COOPERATION TO SUPPORT RESPONSIBLE FISHERIES IN THE ADRIATIC SEA

SURVEY	UNIT	NUMBER OF HAULS	NUMBER OF DAYS
ADRIAMED_2001	CROATIA	17	6

DATE: 14/01/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
1	☑	21116	AND	TARTA	16	3.3	1630	37	10	0.0163
2	☑	21116	AND	TARTA	40	3.9	4815	40	10	0.0481

DATE: 14/02/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
6	☑	21117	AND	TARTA	60	3.7	6852	62	10	0.0685
8	☑	21116	AND	TARTA	60	3.8	7038	49	10	0.0704
10	☑	21117	AND	TARTA	57	3.8	6686	74	10	0.0669

DATE: 15/02/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
9	☑	21117	AND	TARTA	60	3.8	7038	86	10	0.0704
13	☑	21118	AND	TARTA	60	3.7	6852	134	10	0.0685
15	☑	21117	AND	TARTA	55	3.7	6281	58	10	0.0628

DATE: 16/02/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
14	☑	21117	AND	TARTA	62	3.9	7464	80	10	0.0746
20	☑	21117	AND	TARTA	60	3.8	7038	64	10	0.0704
21	☑	21116	AND	TARTA	58	3.8	6803	25	10	0.0680
22	☑	21117	AND	TARTA	4	3.7	457	70	10	0.0046

DATE: 17/02/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
11	☑	21119	AND	TARTA	62	3.8	7272	200	10	0.0727
12	☑	21118	AND	TARTA	62	3.8	7272	173	10	0.0727

DATE: 18/02/2002

HAUL N.	VALID.	STRATUM	VESSEL	GEAR	DUR.(min)	SP.(kn)	LEN.(m)	DEPTH(m)	H.SPR.(m)	S.A..(km2)
3	☑	21116	AND	TARTA	49	3.8	5747	48	10	0.0575
4	☑	21117	AND	TARTA	61	3.8	7155	62	10	0.0716
7	☑	21117	AND	TARTA	60	3.8	7038	83	10	0.0704

21116	1 2 3 8 21
21117	4 6 7 9 10 14 15 20 22
21118	12 13
21119	11

20/05/2005 9.57.59 ADMIN Pagina 1 di 1

Annex B - List of the Species code

Species Code	Scientific Name
ABRAVER	*Abralia veranyi*
ABRRALB	*Abra alba*
ACANEXI	*Acantephyra eximia*
ACANPEL	*Acanthephyra pelagica*
ACATPAL	*Acantholabrus palloni*
AEQUOPE	*Aequipecten opercularis*
ALCYPAL	*Alcyonium palmatum*
ALEPROS	*Alepocephalus rostratus*
ALLOMED	*Alloteuthis media*
ALLOSPP	*Alloteuthis spp*
ALLOSUB	*Alloteuthis subulata*
ALOPVUL	*Alopias vulpinus*
ALOSFAL	*Alosa fallax*
ALPHGLA	*Alpheus glaber*
ALPHPLA	*Alpheus platydactylus*
AMYGLUT	*Amygdalum luteum*
ANADDIL	*Anadara diluvii*
ANAMRIS	*Anamathia rissoana*
ANAPBIC	*Anapagurus biconiger*
ANAPLAE	*Anapagurus laevis*
ANARGRA	*Anarchias euryurus (grassii)*
ANCINIC	*Ancistroteuthis lichtensteini*
ANGUANG	*Anguilla anguilla*
ANTHANT	*Anthias anthias*
ANTOMEG	*Antonogadus megalokynodon*
ANTOSPP	*Antonogadus spp*
APHIMIN	*Aphia minuta*
APOGIMB	*Apogon imberbis*
APORPES	*Aporrhais pespelecani*
APORSER	*Aporrhais serresianus*
APTECAE	*Apterichthus caecus*
ARGESPY	*Argentina sphyraena*
ARGOOLE	*Argobuccinum olearium*
ARGRACU	*Argyropelecus aculeatus*
ARGRHEM	*Argyropelecus hemigymnus*
ARGYREG	*Argyrosomus regius*
ARIOBAL	*Ariosoma balearicum*
ARISFOL	*Aristaeomorpha foliacea*
ARITANT	*Aristeus antennatus*
ARMIMAC	*Arminia maculata*
ARMITIG	*Armina tigrina*
ARNOIMP	*Arnoglossus imperialis*
ARNOLAT	*Arnoglossus laterna*
ARNORUP	*Arnoglossus rueppelli*
ARNOTHO	*Arnoglossus thori*
ASPICUC	*Aspitrigla cuculus*
ASPIOBS	*Aspitrigla obscura*
ASTARUG	*Astacea rugosa*
ASTRSPP	*Astropecten spp*
ATELROT	*Atelecyclus rotundatus*
ATRIFRA	*Atrina fragilis (= Pinna pectinata)*
AULOFIL	*Aulopus filamentosus*
BALICAR	*Balistes carolinensis*
BASOPRO	*Bathysolea profundicola*
BATHDUB	*Batthypterois dubius*
BATHMED	*Bathypterois mediterraneus*
BATISPO	*Bathypolypus sponsalis*
BATYMAR	*Bathynectes maravigna*
BATYSUP	*Bathynectes superbus*
BELLAPO	*Bellotia apoda*
BENSGLA	*Benthosema glaciale*
BENTROB	*Benthocometes robustus*
BERYDEC	*Beryx decadactylus*
BERYSPL	*Beryx splendens*
BLENBAS	*Lipophrys (Blennius)*
BLENCRI	*Scartella (Blennius) cristata*
BLENGAT	*Parablennius (Blennius)*
BLENOCE	*Blennius ocellaris*
BLENPAV	*Lipophrys (Blennius) pavo*
BLENSPP	*Blennius spp.*
BLENSPY	*Aidablennius (Blennius)*
BLENTEN	*Parablennius (Blennius)*
BOOPBOO	*Boops boops*
BOROANT	*Borostomias antarcticus*
BOTHPOD	*Bothus podas*
BRACRII	*Brachioteutis riisei*
BRESSPP	
BRURSPP	
BUCCCOR	*Buccinulum corneum*
BUCCHUN	*Buccinum humphreysianum*
BUCCSPP	*Buccinum spp.*
BUGLLUT	*Buglossidium luteum*
CALAGRA	*Calappa granulosa*
CALCTUB	*Calcinus tubularis*
CALICHI	*Calyptraea chinensis*
CALLRIS	
CALLRUB	*Callanthias ruber*
CALMLYR	*Callionymus lyra*
CALMMAC	*Callionymus maculatus*
CALMPHA	*Synchiropus (Callionymus)*
CALMRIS	*Callionymus risso*
CALOCOR	*Calocarides coronatus*
CALOMAC	*Calocaris macandreae*
CANCCAN	*Cancellaria cancellata*
CANIGRA	*Calliostoma granulatum*
CAPOAPE	*Capros aper*
CARAHIP	*Caranx hippos*
CARARHO	*Caranx rhonchus*

CARCPLU	*Carcharhinus plumbeus*
CARCSPP	*Carcharhinus spp*
CARDACU	*Acanthocardia aculeata*
CARDECH	*Acanthocardia (Cardium)*
CARDSPI	*Acanthocardia spinosa*
CARISPP	*Cardiomya spp.*
CARISTE	*Caridion steveni*
CARPACU	*Carapus acus*
CASSECH	*Cassidaria echinophora*
CASSSAB	*Phalium (Cassis) saburon*
CASSTYR	*Cassidaria tyrrhena*
CATAALL	*Cataetyx alleni*
CECACIR	*Centracanthus cirrus*
CENONIG	*Centrolophus niger*
CENTGRA	*Centrophorus granulosus*
CENTUYA	*Centrophorus uyato*
CEPHVOL	*Dactylopterus*
CEPOMAC	*Cepola rubescens*
CERAMAD	*Cerastocopelus maderensis*
CHAUSLO	*Chauliodus sloani*
CHEOLAB	*Chelon labrosus*
CHIMMON	*Chimaera monstrosa*
CHLAOPE	
CHLAVAR	*Chlamys varia*
CHLOGRA	*Chlorotocus crassicornis*
CHROCHR	*Chromis chromis*
CIRCCAS	*Circomphalus casinus*
CIROBOR	*Cirolana borealis*
CITHMAC	*Citharus linguatula*
CLOPBIC	*Chlopsis bicolor*
CLORAGA	*Chlorophthalmus agassizii*
COBLGAL	*Coryphoblennius galerita*
COELCOE	*Coelorhynchus coelorhynchus*
COELOCC	*Coelorhynchus occa (labiatus)*
CONGCON	*Conger conger*
CORIJUL	*Coris julis*
CORYGUN	*Coryphaenoides guentheri*
CRANSPP	*Crangon spp*
CRASGIG	*Crassostrea gigas*
CRASSPP	*Crassostrea spp.*
CUBIGRA	*Cubiceps gracilis*
CUSPCUS	*Cuspidaria cuspidata*
CYCLPIG	*Cyclothone pygmaea*
CYCLSPP	*Cyclothone spp*
CYMACOR	*Cymatium corrogatum*
CYMBOLL	*Cymbium olla*
CYNPFER	*Cynoponticus ferox*
DALOIMB	*Dalophis imberbis*
DARDARR	*Dardanus arrosor*
DARDCAL	*Dardanus calidus*
DASICEN	*Dasyatis centroura*
DASIPAS	*Dasyatis pastinaca*
DASITOR	*Dasyatis tortonesi*
DASIVIO	*Dasyatis violacea*
DENTDEN	*Dentex dentex*

DENTGIB	*Dentex gibbosus*
DENTMAC	*Dentex macrophthalmus*
DENTMAR	*Dentex maroccanus*
DENTSPP	*Dentalium spp*
DIAPHOL	*Diaphus holti*
DIAPMET	*Diaphus metopoclampus*
DIAPRAF	*Diaphus rafinesqei*
DIAPSPP	*Diaphus spp*
DICAMAY	*Dicranodromia mayheuxi*
DICELAB	*Dicentrarchus labrax*
DICEPUN	*Dicentrarchus punctatus*
DICOCUN	*Dicologoglossa cuneata*
DIODITA	*Diodora italica*
DIPGBIM	*Diplacogaster bimaculata*
DIPLANN	*Diplodus annularis*
DIPLCER	*Diplodus cervinus cervinus*
DIPLPUN	
DIPLSAR	*Diplodus sargus*
DIPLVUL	*Diplodus vulgaris*
DORHTHO	*Dorhynchus thomsoni*
DORILAN	*Dorippe lanata*
DORITHO	*Dorhynchus thomsoni*
DORSVER	*Doris verrucosa*
DOSISPP	*Dosinia spp*
DROMPER	*Dromia personata*
EBALCRA	*Ebalia cranchi*
EBALNUX	*Ebalia nux*
ECHEMIR	*Echelus myrus*
ECHIDEN	*Echiodon dentatus*
ELECRIS	*Electrona rissoi*
ELEDCIR	*Eledone cirrosa*
ELEDMOS	*Eledone moschata*
ELEDSPP	*Eledone spp*
ENGRENC	*Engraulis encrasicholus*
EPHIGUT	*Ephippion guttiferum*
EPIGCON	*Epigonus constanciae*
EPIGDEN	*Epigonus denticulatus*
EPIGTEL	*Epigonus telescopus*
EPINAEN	*Epinephelus aeneus*
EPINALE	*Epinephelus alexandrinus*
EPINCAN	*Epinephelus caninus*
EPINGUA	*Epinephelus guaza*
EPINSPP	*Epinephelus spp*
ERETKLE	*Eretmophorus kleinenbergi*
ERGACLO	*Ergasticus clouei*
ETHUMAS	*Ethusa mascarone*
ETMOSPI	*Etmopterus spinax*
EUCHLIG	*Euchirograpsus liguricus*
EUCRSPP	
EUPHSPP	*Euphausiidae*
EURYASP	*Eurynomia aspera*
EUTRGUR	*Eutrigla gurnardus*
EVERBAL	*Evermannella balboi (ou balbo)*
FLEXFLE	*Flexopecten flexuosus*
FUNCWOO	*Funchalia woodwardi*

FUSIROS	*Fusinus rostratus*
FUSTUND	*Fusituris undatiruga*
GADAMAR	*Gadella maraldi*
GADIARG	*Gadiculus argenteus*
GADUMER	*Merlangius merlangus*
GAIDMED	*Gaidropsarus mediterraneus*
GAIDVUL	*Gaidropsarus vulgaris*
GALADIS	*Galathea dispersa*
GALAINT	*Galathea intermedia*
GALANEX	*Galathea nexa*
GALEGAL	*Galeorhinus galeus*
GALIDEC	*Galeoides decadactylus*
GALUATL	*Galeus atlanticus*
GALUMEL	*Galeus melastomus*
GENNELE	*Gennadas elegans*
GEPYDAR	*Gephyroberyx darwini*
GERYLON	*Geryon longipes*
GIBBSPP	*Gibbula sp.*
GLOSLEI	*Glossanodon leioglossus*
GLOSVAL	*Glossodoris valenciennesi*
GLOUHUM	*Glossus humanus*
GNATMYS	*Gnathophis mystax*
GOBICOL	*Deltentosteus (Gobius)*
GOBIFRI	*Leusueurigobius (Gobius)*
GOBIGEN	*Gobius geniporus*
GOBILIN	*Crystallogobius (Gobius)*
GOBINIG	*Gobius niger*
GOBIQUA	*Deltentosteus(Gobius*
GOBISAN	*Lesueurigobius (Gobius)*
GOBISPP	*Gobius spp*
GOBISUE	*Lesueurigobius suerii*
GONERHO	*Goneplax rhomboïdes (= angulata)*
GONICOC	*Gonichthys coccoi*
GONODEN	*Gonostoma denudatum*
GYMACIC	*Gymnammodytes cicerellus*
GYMNALT	*Gymnura altavela*
HADRCRA	*Hadriana craticuloides*
HELIDAC	*Helicolenus dactylopterus*
HEPTPER	*Heptranchias perlo*
HETEDIS	*Heteroteuthis dispar*
HEXAGRI	*Hexanchus griseus*
HEXAVIT	*Hexanchus nakamurai*
HINIINC	*Hinia incrassata*
HINIRET	*Hinia reticulata*
HIPPHIC	*Hippocampus hippocampus*
HISTBON	*Histioteuthis bonnellii*
HISTREV	*Histioteuthis reversa*
HISTSPP	*Histioteuthis spp*
HOMAVUL	*Homarus vulgaris*
HOMOBAR	*Homola barbata*
HOPLATL	*Hoplostethus atlanticus*
HOPLMED	*Hoplostethus mediterraneus*
HYGOBEN	*Hygophum benoiti*
HYGOHIG	*Hygophum hygomii*
HYMEITA	*Hymenocephalus italicus*

HYMPSPP	*Hymenopenaeus spp.*
HYPESPP	*Hyperiidae*
HYPOPIC	*Hyporhamphus picarti*
ICHTOVA	*Ichthyococcus ovatus*
ILLECOI	*Illex coindetii*
INACCOM	*Inachus communissimus*
INACDOR	*Inachus dorsettensis*
INACTHO	*Inachus thoracicus*
JAXENOC	*Jaxea nocturna*
LABRVIR	*Labrus viridis*
LABSBIM	*Labrus bimaculatus*
LAEVCAR	*Laevicardium oblongum*
LAGOLAG	*Lagocephalus lagocephalus*
LAMACRO	*Lampanyctus crocodilus*
LAMAPUS	*Lampanyctus pusillus*
LAMASPP	*Lampanyctus spp*
LAMPGUT	*Lampris guttatus*
LAPPFAS	*Lappanella fasciata*
LATRSPP	
LEPALEP	*Lepadogaster lepadogaster*
LEPICAU	*Lepidopus caudatus*
LEPMBOS	*Lepidorhombus boscii*
LEPMWHS	*Lepidorhombus whiffiagonis*
LEPOLEP	*Lepidion lepidion*
LEPTCAV	*Lepidotrigla cavillone*
LEPTDIE	*Lepidotrigla dieuzeidei*
LESTSPD	*Lestidiops sphyrenoides*
LESTSPP	*Lestidiops spp*
LICHAMI	*Lichia amia*
LIGUENS	*Ligur ensiferus*
LISSCHI	*Lissa chinagra*
LITHMOR	*Lithognathus mormyrus*
LIZAAUR	*Liza aurata*
LIZARAM	*Liza ramada*
LIZASAL	*Liza saliens*
LOBIDOF	*Lobianchia dofleini*
LOBIGEM	*Lobianchia gemellarii*
LOLIFOR	*Loligo forbesi*
LOLIVUL	*Loligo vulgaris*
LOPHBUD	*Lophius budegassa*
LOPHPIS	*Lophius piscatorius*
LOPOTYP	*Lophogaster typicus*
LUNACAT	*Lunatia catena*
LUNAFUS	*Lunatia fusca*
LUTRSPP	*Lutraria spp.*
MACOSCO	*Macrorhamphosus scolopax*
MACRLIN	*Macropodia linaresi*
MACRLON	*Macropodia longipes*
MACRROS	*Macropodia rostrata*
MAJACRI	*Maja crispata*
MAJASQU	*Maja squinado*
MAURMUE	*Maurolicus muelleri*
MCPIARC	*Liocarcinus arcuatus*
MCPICOR	*Liocarcinus corrugatus*
MCPIDEP	*Liocarcinus (Macropipus)*
MCPIMAC	*Liocarcinus maculatus*

MCPIPUB	*Necora (Macropipus) puber*
MCPITUB	*Macropipus tuberculatus*
MEGANOR	*Meganyctiphanes norvegica*
MELAATL	*Melanostigma atlanticum*
MERLMER	*Merluccius merluccius*
MICMPOU	*Micromesistius poutassou*
MICOSAB	*Microcosmus sabatieri*
MICRMCS	*Microstoma microstoma*
MICUAZE	*Microchirus azevia*
MICUBOS	*Microchirus boscanion*
MICUOCE	*Microchirus ocellatus*
MICUVAR	*Microchirus variegatus*
MOLAMOL	*Mola mola*
MOLVDYP	*Molva dipterygia*
MOLVMOL	*Molva molva*
MONOHIS	*Monochirus hispidus*
MORAMOR	*Mora moro*
MORIRUG	*Morio rugosa*
MUGICEP	*Mugil cephalus*
MUGISPP	*Mugilidae*
MULLBAR	*Mullus barbatus*
MULLSUR	*Mullus surmuletus*
MUNICUR	*Munida curvimana*
MUNIINT	*Munida intermedia*
MUNIIRI	*Munida iris*
MUNIPER	*Munida perarmata (= tenuimana)*
MUNIRUG	*Munida rugosa*
MUNITEN	*Munida tenuimana*
MURAHEL	*Muraena helena*
MUREBRA	*Bolinus (Murex) brandaris*
MURETRU	*Murex trunculus*
MUSTAST	*Mustelus asterias*
MUSTMED	*Mustelus mediterraneus*
MUSTMUS	*Mustelus mustelus*
MYCOPUN	*Myctophum punctatum*
MYCOSPP	*Myctophidae*
MYCTRUB	*Mycteroperca rubra*
MYLIAQU	*Myliobatis aquila*
MYTIGAL	*Mytilus galloprovincialis*
MYTISPP	*Mytilus spp*
NANSOBI	*Nansenia oblita*
NASSSPP	*Nassariidae*
NATIMIL	*Naticarius millepunctatus*
NATISPP	*Naticidae*
NAUCDUC	*Naucrates ductor*
NEMISCO	*Nemichthys scolopaceus*
NEORCAR	*Neorossia caroli*
NEPRNOR	*Nephrops norvegicus*
NEROMAC	*Nerophis maculatus*
NEROOPH	*Nerophis ophidion*
NETOBRE	*Dysomma (Nettodarus)*
NETTMEL	*Nettastoma melanurum*
NEZUAEQ	*Nezumia aequalis*
NEZUSCL	*Nezumia sclerorhynchus*

NOTABON	*Notacanthus bonapartei*
NOTORIS	*Notolepis rissoi*
NOTSBOL	*Notoscopelus bolini*
NOTSELO	*Notoscopelus elongatus*
NOTSKRO	*Notoscopelus kroyerii*
OBLAMEL	*Oblada melanura*
OCENERI	*Ocenebra erinacea*
OCTODEP	*Octopus defilippi*
OCTOMAC	*Octopus macropus*
OCTOSAL	*Octopus salutii*
OCTOSPP	*Octopus spp*
OCTOTET	*Pteroctopus tetracirrhus*
OCTOVUL	*Octopus vulgaris*
OCYTTUB	*Ocythoe tubercolata*
ODONFER	*Odontaspis ferox*
ODONTAU	*Eugonphodus (Odontaspis)*
OEDALAB	*Oedalechilus labeo*
OLIGATE	*Oligopus ater*
ONYCBAN	*Onychoteuthis banksi*
ONYCSPP	*Onychoteuthis spp*
OPDIBAR	*Ophidion barbatum*
OPDIROC	*Ophidion rochei*
OPHCRUF	*Ophichthus rufus*
OPHISER	*Ophisurus serpens*
OPHOFRA	*Ophiothrix fragilis*
OPISSPP	*Opisthobranchia spp*
OPLOSPP	*Oplophoridae*
OPTOAGA	*Opistoteuthis agassizii*
OSTREDU	*Ostrea edulis*
OSTRSPP	*Ostrea spp*
OXYNCEN	*Oxynotus centrina*
PAGEACA	*Pagellus acarne*
PAGEBOG	*Pagellus bogaraveo*
PAGEERY	*Pagellus erythrinus*
PAGIERE	*Paguristes eremita*
PAGUALA	*Pagurus alatus*
PAGUCUA	*Pagurus cuanensis*
PAGUEXC	*Pagurus excavatus*
PAGUFOR	*Pagurus forbesii*
PAGUPRI	*Pagurus prideauxi*
PALIELE	*Palinurus elephas*
PALIMAU	*Palinurus mauritanicus*
PANDPRO	*Pandalina profonda*
PAPANAR	*Parapandalus narval*
PAPELON	*Parapenaeus longirostris*
PAPOHUM	*Parapristipoma humile*
PAPOOCT	*Parapristipoma octolineatum*
PARALEP	*Paraliparis leptochirus*
PARLCOR	*Paralepis coregonoides*
PARLSPE	*Paralepis speciosa*
PAROCUV	*Paromola cuvieri*
PARTANG	*Parthenope angulifrons*
PARTMAC	*Parthenope macrochelos*
PARTMAS	*Parthenope massena*
PASIMUL	*Pasiphaea multidentata*

PASISIV	*Pasiphaea sivado*
PECTJAC	*Pecten jacobaeus*
PECTMAX	*Pecten maximus*
PELTATR	*Peltodoris atromaculata*
PENAKER	*Penaeus kerathurus*
PENNPHO	*Pennatula phosphorea*
PERCGRA	*Periclimenes granulatus*
PERICAT	*Peristedion cataphractum*
PHALGRA	*Phallium granulatum*
PHILECH	*Philoceras echinulatus*
PHOTSPP	
PHRYREG	*Phrynorhombus regius*
PHYIBLE	*Phycis blennoides*
PHYIPHY	*Phycis phycis*
PHYLTRU	*Phylonotus*
PHYSDAL	*Physiculus dalwigki*
PILUSPI	*Pilumnus spinifer*
PILUVIL	*Pilumnus villosissimus*
PINNNOB	*Pinna nobilis*
PINNPEC	
PINOPIN	*Pinnotheres pinnotheres*
PISAARN	*Pisa armata*
PISANOD	*Pisa nodipes*
PISILON	*Pisidia longicornis*
PLATFLE	*Platichthys flesus*
PLEOMED	*Plectorhinchus mediterraneus*
PLERMEC	*Pleurobranchea meckely*
PLESACA	*Plesionika acanthonotus*
PLESANT	*Plesionika antigai*
PLESEDW	*Plesionika edwardsii*
PLESGIG	*Plesionika gigliolii*
PLESHET	*Plesionika heterocarpus*
PLESMAR	*Plesionika martia*
PLEUPIL	*Pleurobrachia pileus*
POLARIS	*Polyacanthonotus rissoanus*
POLBHEN	*Polybius henslowi*
POLCTYP	*Polycheles typhlops*
POLYAME	*Polyprion americanum*
POMABEN	*Pomadasys incisus (bennetti)*
POMSMAR	*Pomatoschistus marmoratus*
POMSMIC	*Pomatoschistus microps*
POMSMIN	*Pomatoschistus minutus*
POMTSAL	*Pomatomus saltator*
PONIKUH	*Pontinus kuhlii*
PONPNOR	*Pontophilus norvegicus*
PONPSPI	*Pontophilus spinosus*
PONTCAT	*Pontocaris cataphractus*
PONTLAC	*Pontocaris lacazei*
PRIOGLA	*Prionace glauca*
PROCEDU	*Processa edulis*
PROCMED	*Processa canaliculata*
PROCNOU	*Processa nouveli*
PROSSPP	*Prosobranchia spp*
PSAMMIC	*Psamechinus*
PSENPEL	*Psenes pellucidus*
PSETMAX	*Psetta maxima*
PSEVCAR	*Pseudosimnia carnea*
PTEOBOV	*Pteromylaeus (Myliobatis)*
PTERHIR	*Pteria hirundo*
PUNTPUN	*Diplodus (Puntazzo) puntazzo*
RAJAALB	*Raja alba*
RAJAAST	*Raja asterias*
RAJABAT	*Raja batis*
RAJABRA	*Raja brachyura*
RAJACIR	*Raja circularis*
RAJACLA	*Raja clavata*
RAJAFUL	*Raja fullonica*
RAJAMEL	*Raja melitensis*
RAJAMIR	*Raja miraletus*
RAJAMON	*Raja montagui*
RAJANAE	*Raja naevus*
RAJAOXY	*Raja oxyrhynchus*
RAJAPOL	*Raja polystigma*
RAJARDA	*Raja radula*
RAJAUND	*Raja undulata*
REGAGLE	*Regalecus glesne*
RHINCEM	*Rhinobatos cemiculus*
RHINRHI	*Rhinobatos rhinobatos*
RHIPMAR	*Rhinoptera marginata*
RHYNHEP	*Rhynchogadus hepaticus*
RICHFRE	*Richardina fredericii*
RISSDES	*Rissoides desmaresti*
RISSPAL	*Rissoides pallidus*
ROCHCAR	*Rochinia carpenteri*
RONDMIN	*Rondeletiola minor*
ROSSMAC	*Rossia macrosoma*
SADASAR	*Sarda sarda*
SALOTRU	*Salmo trutta trutta*
SARDPIL	*Sardina pilchardus*
SARIAUR	*Sardinella aurita*
SARIMAD	*Sardinella maderensis*
SARPSAL	*Sarpa salpa*
SCAEUNI	*Scaeurgus unicirrhus*
SCALSCA	*Scalpelum scalpelum*
SCAPNIG	*Scaphander lignarius*
SCHEOVA	*Schedophilus ovalis*
SCIAUMB	*Sciaena umbra*
SCOBSAU	*Scomberesox saurus*
SCOHRHO	*Scophthalmus rhombus*
SCOMPNE	*Scomber (Pneumatophorus) japonicus*
SCOMSCO	*Scomber scombrus*
SCORELO	*Scorpaena elongata*
SCORLOP	*Scorpaena loppei*
SCORMAD	*Scorpaena maderensis*
SCORNOT	*Scorpaena notata*
SCORPOR	*Scorpaena porcus*
SCORSCO	*Scorpaena scrofa*
SCYLARC	*Scyllarus arctus*
SCYLLAT	*Scyllarides latus*
SCYLPYG	*Scyllarus pygmaeus*
SCYMLIC	*Dalatias (Scymnorhinus) licha*

SCYOCAN	*Scyliorhinus canicula*
SCYOSTE	*Scyliorhinus stellaris*
SEPENEG	*Sepietta neglecta*
SEPEOBS	*Sepietta obscura*
SEPEOWE	*Sepietta oweniana*
SEPESPP	*Sepietta spp*
SEPIELE	*Sepia elegans*
SEPIOFF	*Sepia officinalis*
SEPIORB	*Sepia orbignyana*
SEPOAFF	*Sepiola affinis*
SEPOINT	*Sepiola intermedia*
SEPOLIG	*Sepiola ligulata*
SEPOROB	*Sepiola robusta*
SEPORON	*Sepiola rondeleti*
SEPOSPP	*Sepiola spp*
SERAATR	*Serranus atricauda*
SERACAB	*Serranus cabrilla*
SERAHEP	*Serranus hepatus*
SERASCR	*Serranus scriba*
SERGARC	*Sergestes arcticus*
SERGROB	*Sergestes robustus*
SERGSAR	*Sergestes sargassi (= henseni)*
SERIDUM	*Seriola dumerili*
SOLEIMP	*Solea impar*
SOLEKLE	*Solea kleini*
SOLELAS	*Solea lascaris*
SOLESEN	*Solea senegalensis*
SOLEVUL	*Solea vulgaris*
SOLOMEM	*Solenocera membranacea*
SPARAUR	*Sparus aurata*
SPARCAE	*Pagrus (Sparus)*
SPARPAG	*Pagrus (Sparus) pagrus*
SPHOCUT	*Sphoeroides cutaneus*
SPHYSPY	*Sphyraena sphyraena*
SPICFLE	*Spicara flexuosa*
SPICMAE	*Spicara maena*
SPICSMA	*Spicara smaris*
SPISSPP	*Spisula spp*
SPISSUB	*Spisula subtruncata*
SPODCAN	*Spondyliosoma cantharus*
SPRASPR	*Sprattus sprattus*
SQUAACA	*Squalus acanthias*
SQUABLA	*Squalus blainvillei*
SQUIMAN	*Squilla mantis*
SQUTACU	*Squatina aculeata*
SQUTOCL	*Squatina oculata*
SQUTSPP	*Squatina spp*
SQUTSQU	*Squatina squatina*
STEPDIA	*Stephanolepis diaspros*
STICREG	*Stichopus regalis*
STOLLEU	*Stoloteuthis leucoptera*
STOMBOA	*Stomias boa*
STROFIA	*Stromateus fiatola*
SUBECAR	*Suberites carnosus*
SUBEDOM	*Suberites domuncula*
SUBESPP	*Suberites spp.*

SYMBVER	*Symbolophorus veranyi*
SYMDCIN	*Symphodus cinereus*
SYMDMED	*Symphodus mediterraneus*
SYMDOCE	*Symphodus ocellatus*
SYMDROS	*Symphodus rostratus*
SYMDTIN	*Symphodus tinca*
SYMPLIG	*Symphurus ligulatus*
SYMPNIG	*Symphurus nigrescens*
SYNDSAU	*Synodus saurus*
SYNGACU	*Syngnathus acus*
SYNGPHL	*Syngnathus phlegon*
SYNGTAE	*Syngnathus taenionotus*
SYNGTYP	*Syngnathus typhle*
TAENGRA	*Taeniura grabata*
TELLSPP	*Tellina spp*
TETHFIM	*Tethys fimbria*
TODASAG	*Todarodes sagittatus*
TODIEBL	*Todaropsis eblanae*
TORPMAR	*Torpedo marmorata*
TORPNOB	*Torpedo nobiliana*
TORPTOR	*Torpedo torpedo*
TRACMED	*Trachurus mediterraneus*
TRACPIC	*Trachurus picturatus*
TRACTRA	*Trachurus trachurus*
TRAHARA	*Trachinus araneus*
TRAHDRA	*Trachinus draco*
TRAHRAD	*Trachinus radiatus*
TRARTRA	*Trachyrhynchus*
TRAYCRI	*Trachyscorpia cristulata*
TRIGLUC	*Trigla lucerna*
TRIGLYR	*Trigla lyra*
TRIILEP	*Trichiurus lepturus*
TRIPLAS	*Trigloporus lastoviza*
TRISCAP	*Trisopterus minutus capelanus*
TRISLUS	*Trisopterus luscus*
TRITNOD	*Charonia (Triton) rubicunda*
TURRCOM	*Turritella communis*
TURRSIM	*Turris similis*
TURRSPP	*Turritella spp*
UMBAMED	*Umbraculum mediterraneum*
UMBRCAN	*Umbrina canariensis*
UMBRCIR	*Umbrina cirrosa*
UMBRRON	*Umbrina ronchus*
URANSCA	*Uranoscopus scaber*
VENUSPP	*Venus spp.*
VENUVER	*Venus verrucosa*
VINCATT	*Vinciguerria attenuata*
VINCPOW	*Vinciguerria poweriae*
XANTCOU	*Medaeus (Xantho) couchi*
XENOCRI	*Xenophora crispa*
XENOSPP	*Xenophora spp*
XIPHGLA	*Xiphias gladius*
ZEUSFAB	*Zeus faber*

Annex C: Example of a sampling form used during the AdriaMed Trawl Survey

AdriaMed Trawl Survey

Haul form

PARTNER:	VESSEL:	DAY:	MONTH:	YEAR:	HAUL code:

COORDINATES AT BEGINNING

TIME (00:00):	LATITUDE (00°00'00)	LONGITUDE (00°00'00):	DEPTH (m):

TIME (00:00):	LATITUDE (00°00'00):	LONGITUDE (00°00'00):	DEPTH (m):

COORDINATES AT THE END

ROUTE:	SPEED (knots):	DURATION (min.):	SWEEP LENGTH:	WARP LENGTH:	BOTTOM SHAPE:

WEATHER CONDITIONS:	SEA CONDITIONS:	WIND DIRECTION AND SPEED:

NOTES:

ENVIRONMENTAL PARAMETERS:	Stored file code (.bin):	Stored file code (ASCII):

SCIENTIFIC STAFF ON BOARD: